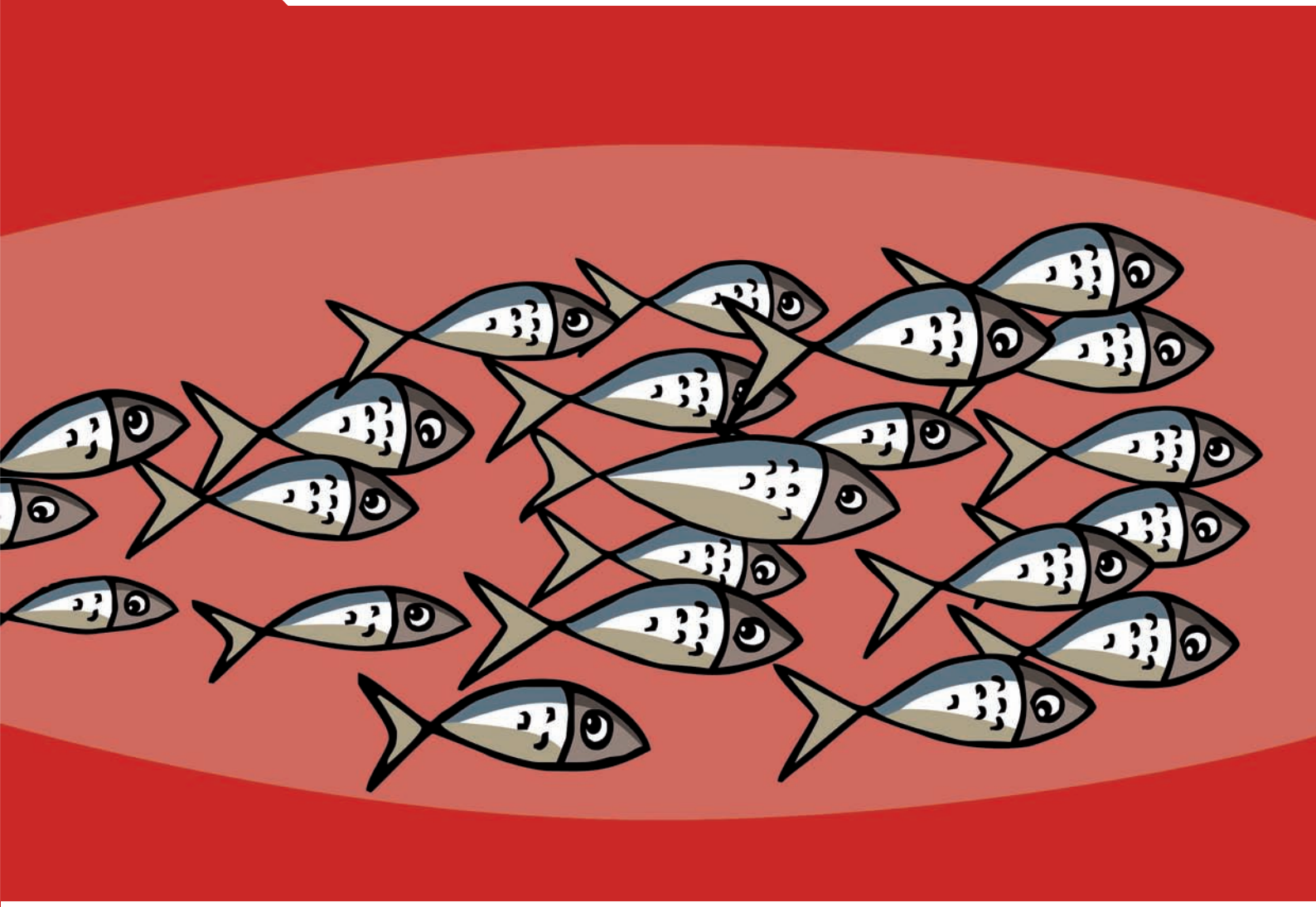
OECD Review of Fisheries 2011

POLICIES AND SUMMARY STATISTICS



OECD

OECD Review of Fisheries 2011

POLICIES AND SUMMARY STATISTICS

OECD
BETTER POLICIES FOR BETTER LIVES

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Foreword

This edition of the OECD Review of Fisheries: Policies and Summary Statistics *consists of three parts. Part I describes recent trends and policies in the fisheries and aquaculture sectors of OECD countries, in addition to examining fisheries issues in several major emerging economies. Part I is largely based on material submitted by OECD member countries and was written by Gunnar Haraldsson and Carl-Christian Schmidt of the OECD Fisheries Policy Division.*

Part II contains the summary report of The Hague Round Table on Eco-labelling and Certification in the Fisheries Sector, held in The Hague on 22-23 April 2009. This Round Table was jointly organised by OECD and FAO in co-operation with the Dutch Ministry of Agriculture, Nature and Food Quality. This summary report, written by Alfons Schmid and John Conelly, respectively Vice President Food Safety and Consumer Affairs of Royal Ahold of the Netherlands and President of the National Fisheries Institute of the United States, gives an overview of the main issues concerning the role of eco-labels and certification schemes in fisheries and aquaculture.

Part III provides a brief review of the fisheries and aquaculture sectors in OECD member countries. Part IV covers non-member economies: Argentina, Chinese Taipei and Thailand. These reviews all highlight recent policy developments.

The OECD Review of Fisheries: Policies and Summary Statistics *was edited by Michèle Patterson, TAD publications assistant. Stefanie Milowski also provided editorial assistance.*

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Acronyms

BMSY	Biological Maximum Sustainable Yield
CCAMLR	Convention of the Conservation of the Antarctic Marine Living Resources
CCFFP	Codex Committee on Fish and Fishery Products
CCRF	Code of Conduct for Responsible Fisheries (FAO)
CFCA	Community Fisheries Control Agency
CFP	Common Fisheries Policy of the European Union
CPUF	Catch per Unit Effort
EEZ	Exclusive Economic Zones
EFF	European Fisheries Fund
EMODNET	European Marine Observation and Data Network
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
FQAs	Fixed Quota Allocations
FOS	Friend of the Sea
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GFSI	Global Food Safety Initiative
GFT	Government Financial Transfers
GMO	Genetically Modified Organism
GRT	Gross Registered Tonnes
GTZ	German Agency for Technical Co-operation
HACCP	Hazard Analysis Critical Control Point
ICES	International Council for the Exploration of the Sea
IMP	Integrated Maritime Policy
IMTA	Integrated Multi-Trophic Aquaculture
IOM	International Ocean Management
ISA	Infectious Salmon Anaemia
ISO	International Organization for Standardisation
ITQ	Individual Transferable Quotas
IUU	Illegal, Unregulated and Unreported Fishing
IWC	International Whaling Commission
LOMA	Large Ocean Management Areas
MEY	Maximum Economic Yield
MPA	Marine Protected Area
MSC	Marine Stewardship Council
MSP	Marine Spatial Planning
MSY	Maximum Sustainable Yield
NAFO	Northwest Atlantic Fisheries Organisation

NAMMCO	North Atlantic Marine Mammal Commission
NGO	Non-Government Organisation
NLDP	National Landings in Domestic Ports
OECD	Organisation for Economic Co-operation and Development
RAS	Recirculating Aquaculture Systems
RFMOs	Regional Fisheries Management Organisations
SPS	Sanitary and Phytosanitary
TAC	Total Allowable Catches
TBT	Technical Barriers to Trade
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	United Nations Fish Stocks Agreement
VPA	Virtual Population Analysis
VQS	Vessel Quota Share
WSSD	World Summit on Sustainable Development
WWF	World Wildlife Fund
WTO	World Trade Organisation

Executive Summary

This report monitors and evaluates fisheries policies in OECD member and non-member countries, as well as in the emerging economies of Brazil, China, India, Indonesia and South Africa.

Recent trends in the OECD fisheries and aquaculture sector

The financial crisis affects seafood markets

The fish trade at the global level was affected by the 2008 financial crisis, with a drop of 12.5% due largely to the collapse in demand and a drying up of trade finance. This had a cascading effect through the value chain, from the catch sector through to retail sales. However, compared to other sectors, such as machinery, transport and manufactured goods, world trade in food and live animals was less affected by this crisis.

International trade in marine fish products increased twofold over the last two decades. Emerging economies, especially in Asia, have not only increased their share of exports but have also increased their imports considerably. This reflects the rapid globalisation of the fisheries markets and the increased buying power of people in emerging economies. Among the OECD countries, Japan, the United States and Spain are the biggest importers. More than half of imports to OECD countries come from Asia, while roughly 22% originates from Central and South American countries (with the exception of Chile).

The effects of the 2008 crisis has been unevenly distributed with the greatest changes in prices and consumption occurring in developed countries, where fish is usually in the high price range of food products and where a considerable part of fish consumption takes place in restaurants. Although developed countries are the biggest importers of fish products, with the European Union the biggest market, China has become a major importer and in 2008 ranked sixth in the world. This development means that China, which is already the biggest fishing nation in the world, is steadily becoming more important as an import market for fish and other marine products. It will be interesting to follow future developments of the Chinese domestic market for seafood products.

While the biggest markets are in developed countries, around 60% of the total of exported fish comes from developing countries. The group of major exporting countries is more heterogeneous, in terms of stage of development, than the group of importers.

Less demand and lower prices may increase fishing pressures as companies try to get through this difficult period. This highlights the importance of responsible fisheries management which aims for long-term sustainable use of marine resources. At the same time, however, it is important to refrain from using protective policies as these have long-term negative effects for producers and consumers alike.

Declining share of OECD catches not necessarily a bad sign

Marine capture fisheries landings in OECD countries in 2008 amounted to roughly 28% of total world production, revealing a steady decrease since the late 1980s. The main reason for this is that OECD countries have taken measures to recover over-fished stocks.

Aquaculture still growing in OECD countries but slower than elsewhere

While aquaculture production has been growing at roughly 8% per year over the last two decades, growth in OECD countries has been relatively constant at about 3.6% per year over the same period. The bulk of the increase in production outside OECD countries has been in Asia, and notably in China. There remain, however, large aquaculture producers among OECD countries, in particular Korea, Japan, Chile and Norway. The production of higher value species in OECD countries explains a higher per unit value of OECD aquaculture production than elsewhere. As most commercially harvested stocks are either fished at or beyond their sustainable levels, there is little scope to greatly increase catches in the near future, although technological advances in aquaculture make it possible to further increase production. Aquaculture production, however, places considerable pressures on the environment and other resources which may hinder further expansion in some places.

Seafood is extensively traded

International trade in marine fish products increased twofold over the last two decades. Emerging economies, especially in Asia, have not only increased their share of exports but have also increased their imports considerably. This reflects the rapid globalisation of the fisheries markets and the increased buying power of people in emerging economies. Among the OECD countries, Japan, the United States and Spain are the biggest importers. More than half of imports to OECD countries come from Asia, while roughly 22% originates from non-OECD countries in Central and South America.

Continuing reduction of fishing fleets while labour numbers are mixed

Many OECD countries have successfully reduced overcapacity of their fishing fleets, both measured in numbers of vessels and tonnage. Several countries have undertaken measures in line with the 2008 OECD *Council Recommendation on the design and implementation of decommissioning schemes in the fishing sector*. This action seems to have had the desired effects although the number of fishers has declined less than would have been expected, at least in some countries, despite smaller fishing fleets.

The number of people working in aquaculture shows a mixed picture as it has increased in some countries while decreased in others. The reason for less employment, where this is the case, may be due to relocation of production to lower wage countries, or that increased technical efficiency has led to less demand for labour.

Changes in composition of government financial transfers

The available data on government financial transfers shows a mixed picture. While some countries report a decline in 2007-09, others show slight increases. As a percentage of landed value, the total of government financial transfers has increased. There seems to be a change in the composition of these transfers when looking at the total for OECD countries. Although the biggest share is classified under general services, which includes transfers for management costs, research, enforcement and infrastructure, this part decreased proportionally between 2007-09 (from 82.3 to 66.1%). Over the same period, the share of direct payments, such as outlays for decommissioning and income support, increased (from 12.3 to 25.7%) as did cost reducing transfers, such as various subsidies and tax exemptions (from 5.4 to 8.2%).

Recent developments in OECD fisheries policies

Combating IUU fishing

Various steps have been taken at the national and international levels to combat illegal, unreported and unregulated (IUU) fishing. An EU Council Regulation concerning IUU fishing came into effect on 1 January 2010. At the international level, representatives from 92 countries agreed in November 2009 on a text for an agreement on Port State Measures to prevent, deter and eliminate IUU fishing. This work has been co-ordinated by the FAO and will enter into force 30 days after being adopted by 25 countries. As of April 2011, 17 countries had signed the agreement. Port State Measures are requirements with which a foreign fishing vessel must comply with. It enlists both non-flag states and flag-states, with the latter being responsible for the behaviour of vessels flying under their flag on the high seas.

Revision of the European Common Fisheries Policy

In 2008, the European Commission began revising the Common Fisheries Policy (CFP). This revision, based on empirical analysis of achievements and failures of the current policy and analysis of alternative fisheries management models, aimed to identify possible improvements to the CFP. Following the publication of a Green Paper on this reform, which highlighted the main challenges, a general consultation process was put in place where stakeholders and the public at large had the opportunity to express their views and contribute to the dialogue. The European Commission is moving in the direction of a more decentralised fisheries governance system with the general principles decided at the Community level, while the day-to-day implementation is left to regional authorities.

Increased use of rights-based management

Many countries, inside and outside the OECD area, are increasingly using rights-based fisheries management instruments. The OECD Committee for Fisheries (COFI) has contributed to the discussion on such instruments with a special publication in 2006 entitled *Using Market Mechanisms to Manage Fisheries: Smoothing the Path*. Denmark gradually introduced individual transferable quotas (ITQ) both in pelagic and demersal fisheries

coupled with effort limitations. This change had significant effects on Danish fisheries, most notably by decreasing the number of boats. Sweden introduced an ITQ system for several pelagic fisheries in 2009.

Integrated oceans management

Recent years have seen a trend towards a more holistic approach to fisheries management which acknowledges fishing as just one of many activities taking place on the world's oceans. There are often conflicting interests that call for an integrated approach to ocean management, and steps in this direction have been taken both at the international and national levels. The 1982 UN Convention on the Law of the Sea, which came into force in 1994, had far ranging impact. This is also true of the 1995 UN Fish Stocks Agreement which stipulates an ecosystem-approach based on the precautionary principle to manage various international fisheries. At the national level, many OECD countries have been at the forefront of this development.

Major emerging economies

The last decade has seen the emergence of fast growing economies with large populations. This has an increasing impact on world markets and the world economy. Many of these countries are big fishing nations with enormous potential to improve the sustainability and socio-economic benefits of their fisheries.

- **Brazil** has announced it will increase public investment in the fisheries sector and plans to increase production, mostly in the aquaculture sector. China has seen its capture production stagnate in recent years, due mostly to overfishing, but the government has responded by introducing a decommissioning scheme in order to reduce overcapacity of the fleet. Aquaculture production has grown at a steady rate but problems, such as pollution and disease outbreak, have occurred with increasing intensity.
- **India** has steadily increased its marine capture production over the last decades. Inland fisheries are also important and aquaculture production has increased threefold since 1990, reaching almost 70 million tonnes in 2008.
- **Indonesia** has also seen a steady increase in its capture and aquaculture production, which slowly increased in the early 1990s but tripled in volume between 2001 and 2008. The Indonesian fishing industry employs more than 6 million people directly and fish consumption is an important source of protein, especially for poor households. Fish consumption is on the rise and fish products are considered to be important for food safety.
- **South Africa** faces both the South Atlantic and the Indian oceans and has access to rich fishing grounds where ocean currents meet. The most important fisheries are the hake fishery, which contributes to around half of the value of fisheries production, and the sardine and anchovy fisheries, which contribute around one-fourth of the value. The recreational fishing sector is also important, both in marine and inland fisheries. The aquaculture sector, both freshwater and marine farming, is developing rapidly.

Policy outlook

At the 2009 OECD Ministerial Council Meeting, a Green Growth Declaration was adopted and a mandate given to the OECD to develop a Green Growth Strategy bringing together

economic, environmental, social, technological, and development aspects into a comprehensive framework. For fisheries, the Green Growth paradigm offers potentially important new insights and a renewed policy framework to ensure that additional issues are addressed.

A Green Growth strategy for fisheries may result in important gains by reducing capacity and rebuilding fish stocks. Such a strategy calls for an ecosystem approach to fisheries management which includes biodiversity conservation.

General Introduction

The 2009 OECD Ministerial Council Meeting adopted a Green Growth Declaration, giving OECD a mandate to develop a Green Growth strategy to bring together economic, environmental, social, technological and development aspects into a comprehensive framework. It has been long recognised that without sustainable management of natural resources the future of fisheries is bleak. Within the fisheries sector, the Green Growth paradigm offers potentially important new insights and a renewed policy framework to ensure that additional issues are addressed at a much wider level, notably by including the social and development aspects.

The overarching objective of the OECD's Green Growth strategy is to help policy makers identify policies that are at once environmentally and socially sustainable, and contribute to economic growth. This means ensuring that enough food is provided for a global population that is steadily increasing, reducing the carbon intensity of the fisheries and aquaculture sector, and managing natural resources in a sustainable manner while reducing the adverse environmental impact it creates. The objective also includes the creation of sustainable jobs.

> "[…] green growth can be seen as a way to pursue economic growth and development, while preventing environmental degradation, biodiversity loss and unsustainable natural resource use. It aims at maximising the chances of exploiting cleaner sources of growth, thereby leading to further 'decoupling' between environmental and economic performance. This will involve seizing the opportunities for development of new green industries, jobs, and technologies, as well as managing the transition for greening the more traditional sectors and the potential associated employment or other distributional impacts. It will require adopting new technologies, developing new products and supporting new patterns of demand from households, companies as well as governments."
>
> Excerpt from *Interim Report of the Green Growth Strategy*:
> *Implementing our commitment for a sustainable future.*

This is an important challenge considering the impact that fisheries have on the marine eco-system and that encompass issues of management, by-catches, effects on broader ecosystems, and biodiversity. It is a challenge that must be dealt with while at the same time providing governance structures and management policies to ensure the continued improvement of the aquatic systems (aquaculture, capture fisheries, marine and inland) capacity to produce protein.

The health of the world's fisheries is important as fisheries support around 170 million jobs worldwide and more than 1.5 billion people rely on marine products for their protein

intake.* A rough estimate suggests that at least half a billion people are dependent on the state of the world's fisheries.

Total marine capture fisheries worldwide has stagnated in value terms, while aquaculture production continues to grow. While capture fisheries have a limited potential for supply, there seems to be ample room for increasing aquaculture production. The major producers and the fastest growth are in non-OECD countries, particularly in Asia. In the OECD area, production is stagnating in many countries and employment is decreasing. There are many possible reasons for such trends, including administrative hurdles and the relocation of production. Aquaculture, however, will play a key role in advancing green growth, especially in many emerging economies, and may contribute to increased food security and food production that has a less harmful impact on the environment when the externalities are addressed effectively.

Nevertheless, challenges remain and good policies are needed for aquaculture to contribute to green growth. In order to cast some light on the changing landscape of the international seafood market, fisheries and aquaculture in major emerging economies receive special attention in this edition of the *Review of Fisheries in OECD Countries 2011: Policies and Summary Statistics*. Brazil, China, India, Indonesia and South Africa are major players on the world market for fish products. The data indicates that these countries, with the exception of South Africa, have experienced rapid growth, especially in aquaculture production. They are not only major suppliers of fish products, but are increasingly important import markets for fish and seafood. Rising national incomes will further increase demand in the future.

As green growth calls for more output with less use of inputs (decoupling), it should come as good news that the data in this *Review* indicates that the fishing fleets of most OECD countries have been decreasing steadily over the last decade, both in terms of number of vessels and total tonnage. However, the consequence has been a reduction of employment in many fisheries. This sets the challenges of finding alternative uses for the existing capital and labour, which often calls for examining various socio-economic policies that are currently in place or proposed.

Important policy developments have taken place over the last few years, both in OECD and non-OECD countries. In particular, efforts have been made to further prevent, deter and eliminate illegal, unreported and unregulated fishing, and increased use of rights based fisheries management has increased economic efficiency and the sustainability of several fisheries. Advances have also been made in several countries to take a more holistic view in the management of ocean and marine aquatic resources through integrated ocean management. These developments are another step in the green growth direction for fisheries.

Eco-labelling and certification in the fisheries sector is a central policy issue as it touches on the roles and the relationship between the public and private sectors in how fisheries are managed. This issue of the *Review of Fisheries in OECD Countries 2011: Policies and Summary Statistics* contains a special chapter on eco-labelling and certification which is based on discussions of an OECD/FAO Round Table which took place in 2009 and additional work carried out by the OECDs Fisheries Committee and published as *Fisheries and Aquaculture Certification* (OECD, 2011).

* United Nations Secretary-General's High-level Panel on Global Sustainability (2012), *Resilient People, Resilient Planet: A future worth choosing*, New York, United Nations.

PART I

General Survey 2011

OECD data for 2009 shows that global trade in food and live animals was not as severely affected by the 2008 economic crisis as for most other sectors. There was a drop of just over 15% from January 2008 to January 2009 compared to a 30% or greater drop for sectors such as machinery and transport, manufactured goods, crude materials (non-edible), and mineral fuels. However, the crisis did impact the consumption of fish, especially in richer countries where fish is mostly consumed in restaurants.

The price of fish fell, in particular for white fish such as cod, resulting in lower profitability for fishing firms. Incoming data for 2009 point to substantial decreases both in value and quantity of traded fish products. The slackening demand and lower prices present the danger of increased fishing effort and more intensive production to get through a difficult period at the expense of longer term resource sustainability. For this reason, responsible and sustainable fisheries management must be encouraged and protective policy measures resisted.

PART I

General Survey 2011

This general survey consists of three sections. Section I.1 describes recent trends in OECD fisheries and aquaculture sectors. Section I.2 discusses several recent developments in fisheries policies in OECD countries with a special section on major emerging economies. Section I.3 presents the policy outlook regarding fisheries and aquaculture in OECD countries.

I.1. Recent trends in the OECD fisheries and aquaculture sector

Globalisation, in view of the advances in storage, transportation and marketing, has made it possible for fish to become a major globally traded commodities in recent decades. In 2008, total world exports of fish reached a record value of USD 102 billion, an 83% increase since 2000.[1]

The 2008 international financial crisis led to a reduction in international trade. In fisheries, OECD figures show a 12.5% drop in 2009 and which was due primarily to collapsed demand and the drying-up of trade finance. With increased vertical integration in global fisheries supply chains, the crisis had a cascading effect and worsened the economic conditions through the whole chain, from the catch sector through to retail.

Recent OECD data shows that global trade in food and live animals was not, however, as severely affected by the crisis than was the case for most other sectors. There was a drop of just over 15% from January 2008 to January 2009, compared with more than a 30% drop for sectors such as machinery and transport, manufactured goods, crude materials (non-edible), and mineral fuels.

According to preliminary data, it seems that the crisis did impact the consumption of fish, especially in richer countries where a big part of consumption takes place in restaurants. Prices of fish fell, in particular for white fish like cod, and resulted in lower profitability for fishing firms. Incoming data for 2009 point to substantial decreases both in value and quantity of traded fish products.

The biggest import markets are in the developed economies, with Japan the biggest national market (USD 14.4 billion in 2008), closely followed by the United States (USD 14.1 billion). Taken as a whole, the European Union is the largest market for imported fish with an overall value of imports from non-European suppliers reaching

USD 24.6 billion in 2008. Interestingly, China was the sixth biggest importer of fish in 2008, underlining the importance of China as a re-processor of fish and fish products. With the steady growth of the Chinese economy, even during the current crisis, it will be interesting to observe the developments in domestic consumption in the years to come.

While the biggest import markets are in OECD countries, half of the value and 60% of the quantity of fish exported to the world market comes from developing countries. China has been the world's biggest exporter since 2002 with a 10% share of total value of world export in 2008. Other major exporting countries are Norway, Thailand, Viet Nam, United States and Chile. The group of major exporting countries is more heterogeneous in terms of stage of development than the group of importers.

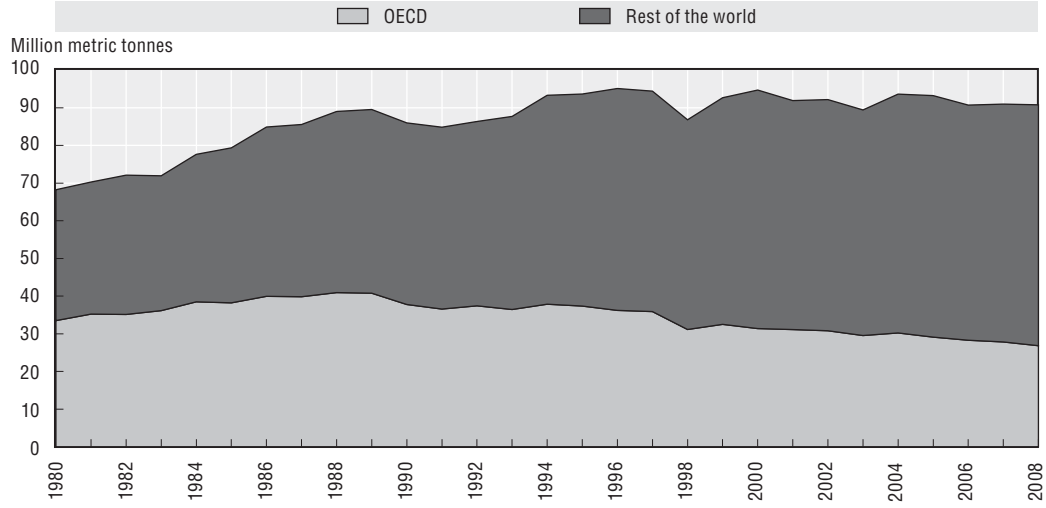
Producers have been hard hit by the slackening demand and lower prices. There is a danger of increased fishing effort and more intensive production to get through this difficult period, perhaps at the expense of longer term resource sustainability. The need for responsible and sustainable fisheries management continues to be important and perhaps even more so today.

The temptation to use protective policy measures is strong during an economic slowdown. However, such measures have long-term negative effects for consumers and producers alike and countries should refrain from using such policy measures.

Marine capture fisheries

Marine capture fisheries landings in OECD countries amounted to around 22.5 million tonnes in 2008, which is roughly 28% of the total world marine capture production (Figure I.1). There has been a nearly constant downward trend in OECD catches since the late 1980s, with an average decline of nearly 2.7% per year since 1988. The principal reason for this is due to measures taken for the recovery of over-fished stocks and underscores the importance, for environmental, social and economic reasons, that governments make an effort to rebuild fisheries.

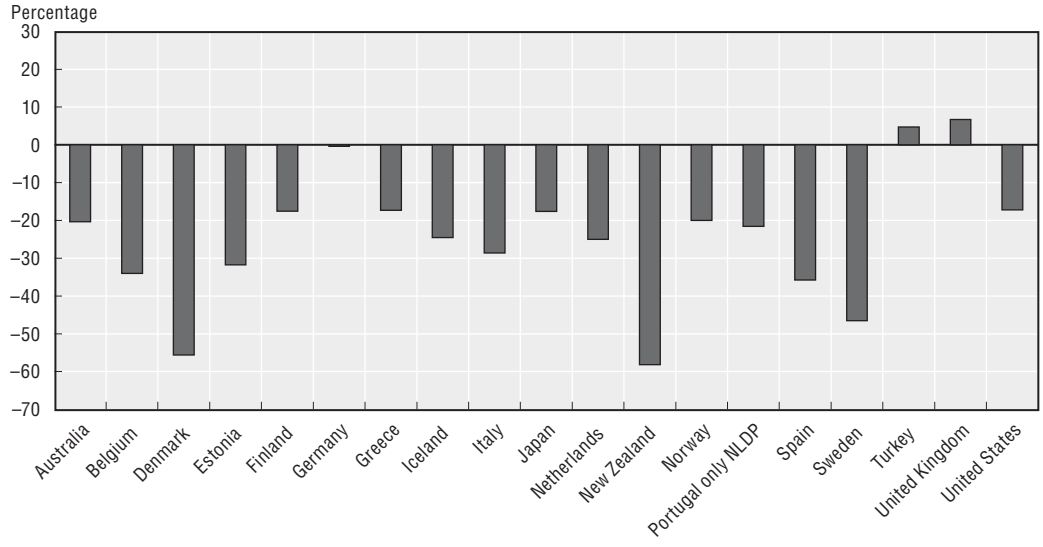
Figure I.1. **World and OECD capture fisheries production**



Source: FAO FishStat Database.

Figure I.2 shows that drastic cuts in marine capture production have occurred in almost all OECD countries since 1998. Only two OECD countries, United Kingdom and Turkey, have been able to increase their marine capture fisheries production during this period.

Figure I.2. **Change in marine capture fisheries 1998-2008**



Denmark, New Zealand, Poland and Sweden have had their catches reduced by more than 40% over this period. Many other countries had their production reduced by around 20%. Japan, United States, Norway and Korea are the largest marine capture fisheries producers in the OECD and those countries were all producing less in 2008 than they did a decade earlier.

Aquaculture production

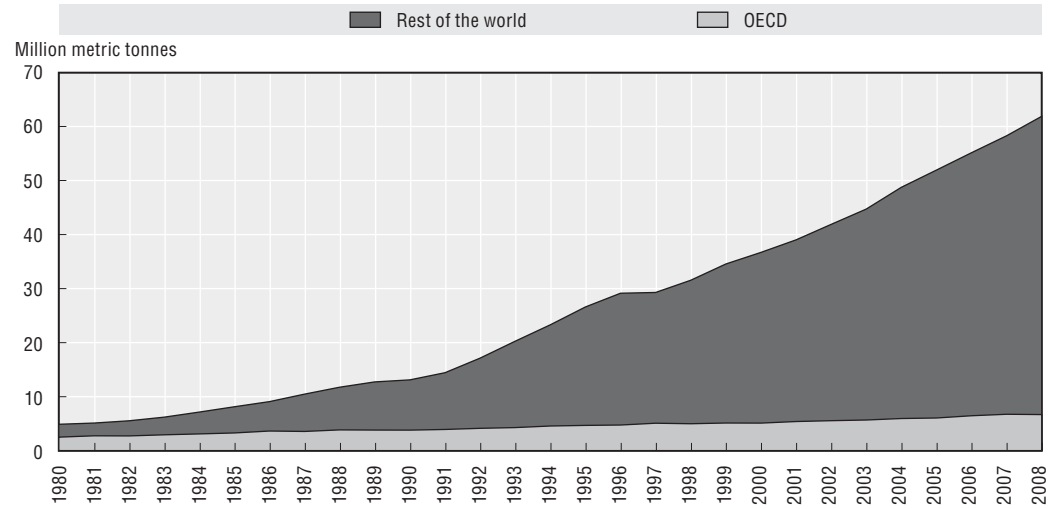
Global aquaculture production has grown by roughly 8% per year over the last two decades. At the same time growth in the aquaculture production in the OECD has been much slower or around 3.6% per year (Figure I.3).

The bulk of increased world aquaculture production has been in Asia with China the biggest producer, accounting for around 62% of the total world production in 2008 (Figure I.4).

OECD countries produced around 10% of the world aquaculture production in 2008, with the largest producers being Korea, Japan, Chile and Norway (Figure I.5). When looking at the value of production, however, (Figure I.6) the picture is somewhat different. While growth in aquaculture production volume has been 8% outside the OECD area and 3.6% in OECD countries, the average growth in value has been 8.8% outside the OECD, but nearly 5.4% in the OECD countries. The higher per unit value of OECD aquaculture production is explained by the high commercial value of the cultured species (*e.g.* salmon, sea bass, and lobster).

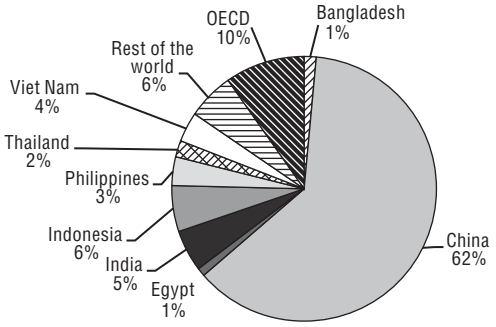
The shift from capture fisheries to aquaculture is mainly driven by two factors. First, capture from wild marine resources can hardly be increased more in a sustainable way. Most commercially harvested fish stocks are either fished at their maximum sustainable level or even above that, which calls for considerable rebuilding. This means there is little scope for increasing the production in capture fisheries. Secondly, technical advances in aquaculture have made it possible to increase the production volumes considerably. The production volume can be potentially further increased, although aquaculture production

Figure I.3. **World aquaculture production**



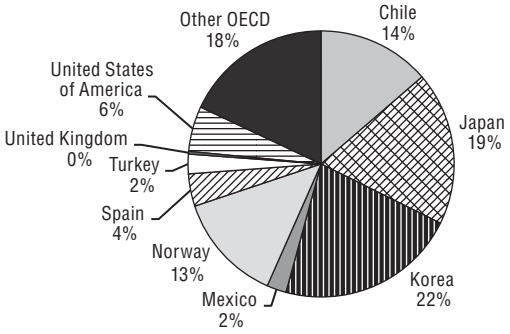
Source: FAO FishStat Database.

Figure I.4. **World aquaculture production in 2008**



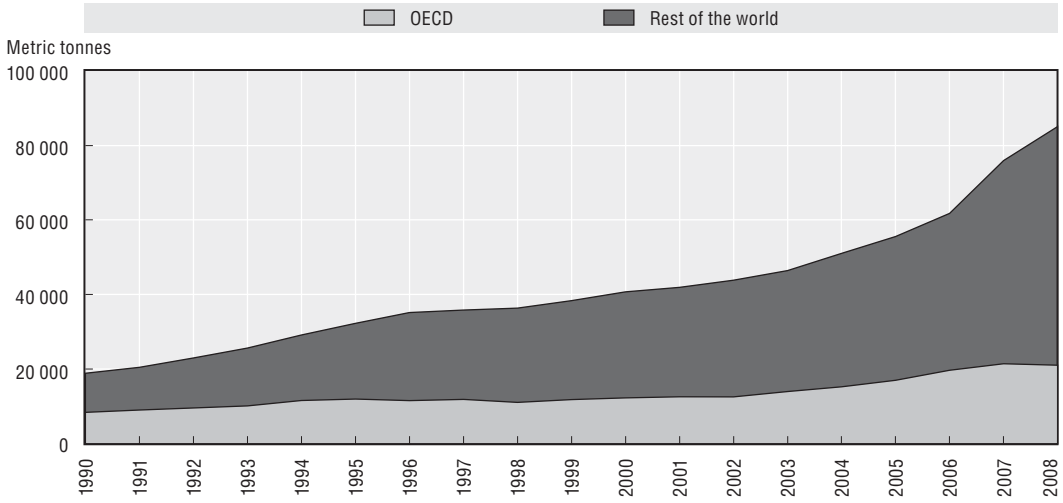
Source: FAO FishStat Database.

Figure I.5. **OECD aquaculture production in 2008**



Source: FAO FishStat Database.

Figure I.6. **Aquaculture production value**



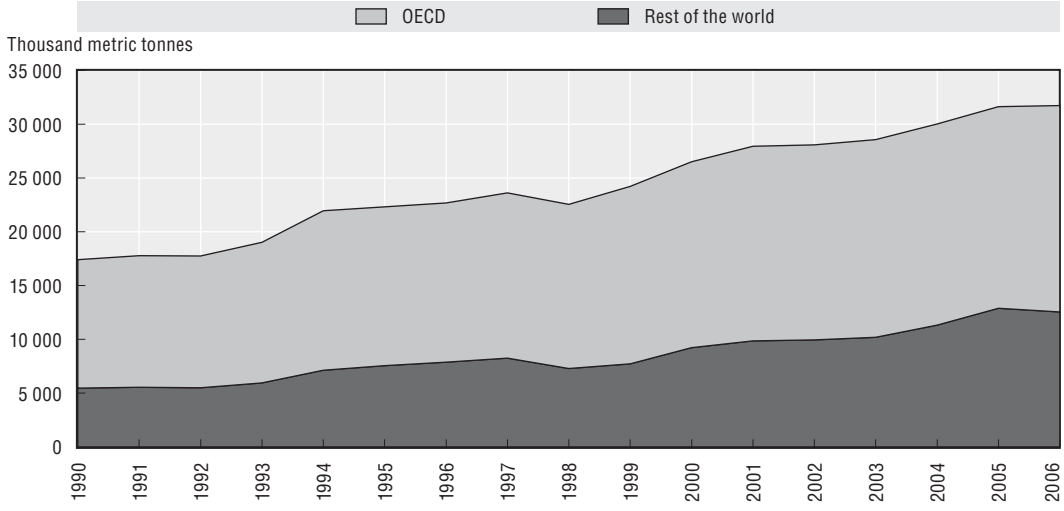
Source: FAO FishStat Database.

in some countries is constrained by ecosystem considerations as it creates pressure on the environment and other resources.

Trade

International trade in marine fish products increased two-fold over the last two decades, benefitting both OECD and non-OECD economies (Figure I.7).

Figure I.7. **Imports of marine products**

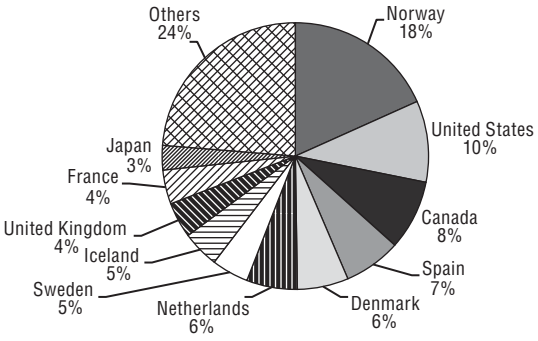


Source: FAO FishStat Database.

It is interesting to observe the trend in trade over the last decade. As global trade in fish and fish product increases, emerging economies in Asia, like China, Thailand and Viet Nam are increasing their share of exports while at the same time increasing their own imports, underscoring the rapidly globalising fisheries markets.

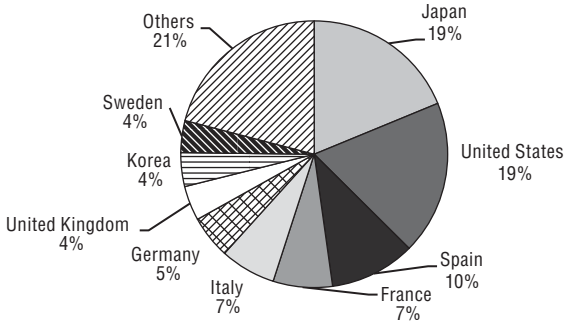
Norway leads the OECD countries in value of exported seafood due to a strong aquaculture sector and well managed marine capture fisheries (Figure I.8).

Figure I.8. **Major OECD seafood exporters 2008**
Country shares of total OECD exports (in USD values)



The largest OECD importers are Japan and the United States, followed by Spain (Figure I.9).

Figure I.9. **Major OECD seafood importers 2008**
Country shares of total imports (in USD values)



In 2008, the OECD countries imported fish products for USD 76.5 billion and exported for USD 44.6 billion. The OECD countries are not only important producers of seafood but also important markets for seafood.

Figure I.10 shows the destination of OECD countries exports of fish products. The main markets are in Asia and in non-OECD European countries.

The imports from non-OECD countries originate mainly from Asia, notably from China and Indonesia as shown in Figure I.11. Around 22% of imports come from non-OECD America.

Fishing fleets and decommissioning schemes

The fishing fleets of most OECD countries have been decreasing steadily over the last decade, both in terms of number of vessels and total tonnage. The OECD previously underscored the necessity to reduce the overcapacity of fleets in many OECD countries and provided best practice recommendations on how to implement decommissioning schemes (OECD, 2009c).

Figure I.10. **Destination of OECD export to non-OECD countries 2008**

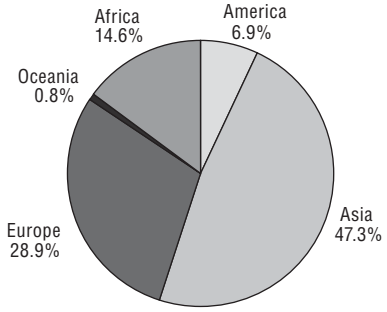


Figure I.11. **Origins of OECD imports from non-OECD countries 2009**

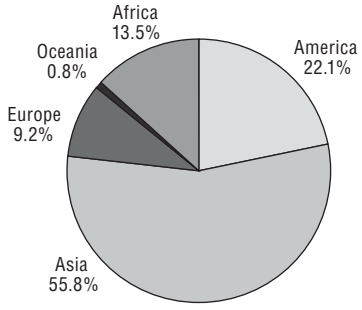
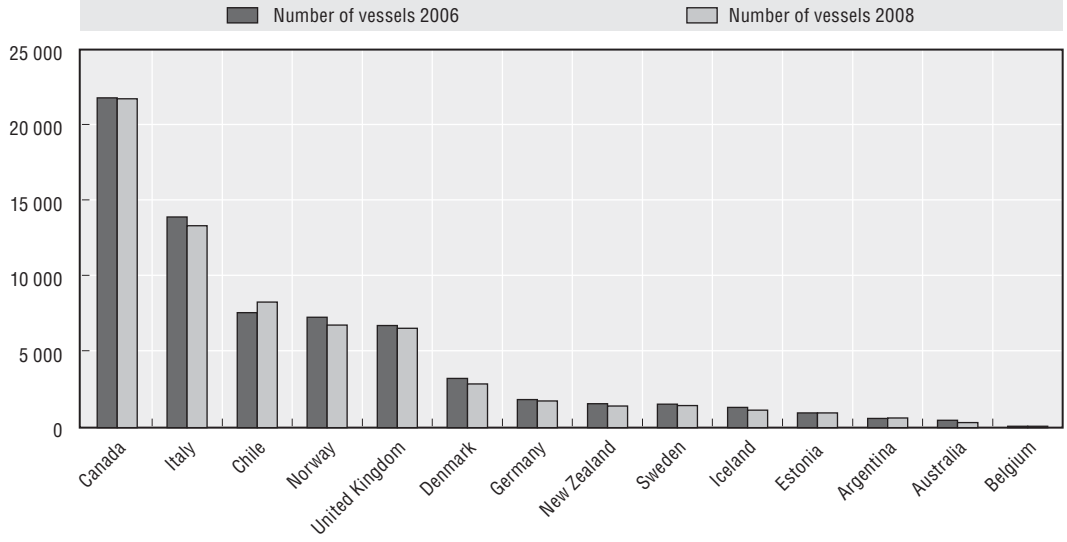


Figure I.12 shows the number of vessels in selected countries from 2005 to 2008. As can be seen, almost all countries have reduced their fleet over this period.

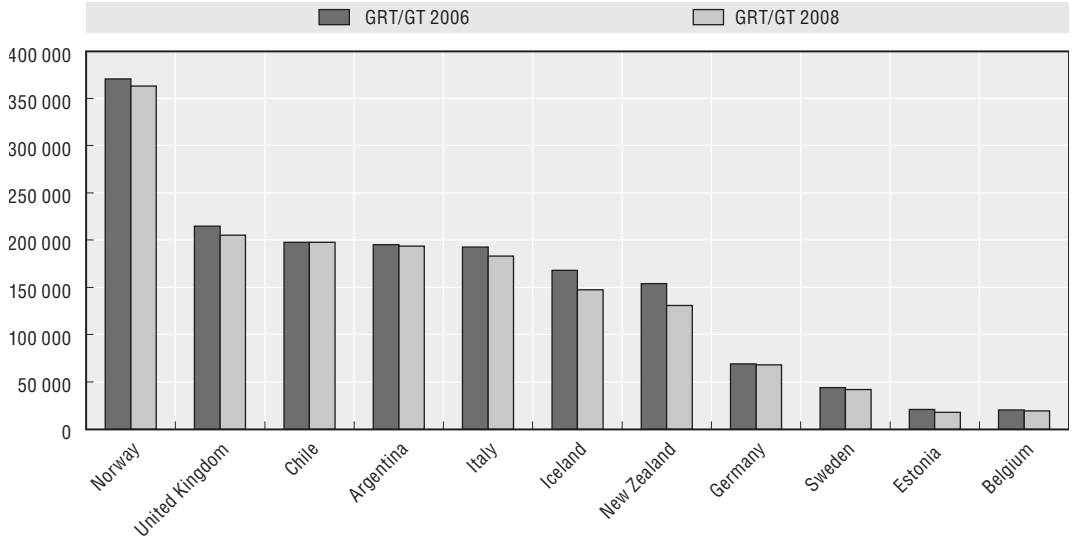
Figure I.12. **Number of vessels of selected countries 2006 and 2008**



Note: Data for Germany: 2009; and Canada: 2005.

Figure I.13 demonstrates the same trend but based on gross registered tonnage of fleets. This indicates that there is every reason to believe that countries have successfully reduced the overcapacity of their fishing fleets.

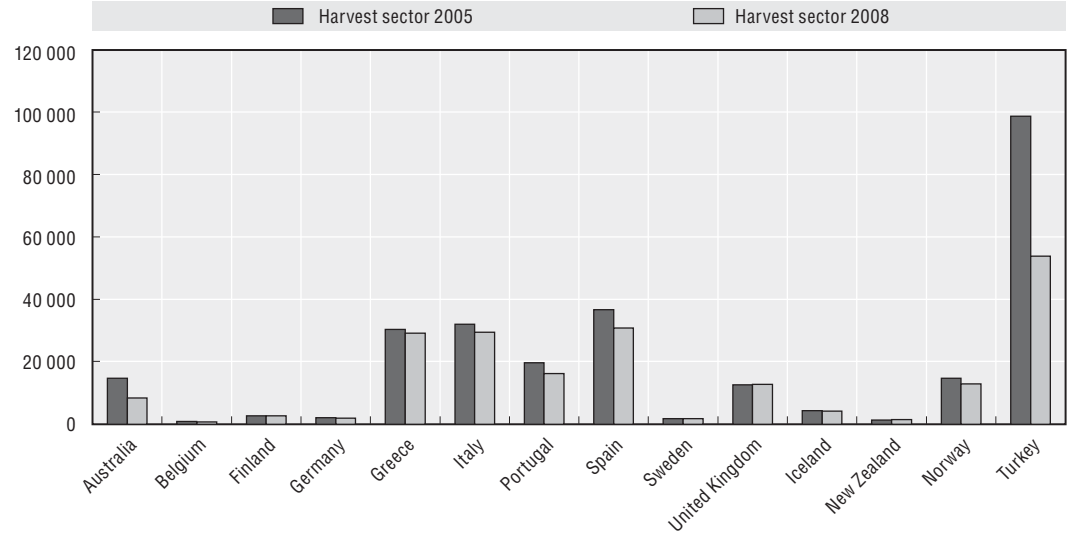
Figure I.13. **Gross registered tonnes (GRT)/gross tonnes (GT), 2005 and 2008**



Employment

Although fleets have been drastically reduced there seems to be less lay-offs of fishers than might be expected. Some countries have seen a considerable reduction in employment (Figure I.14).

Figure I.14. **Number of people working in the harvesting sector, 2005 and 2008**



Interestingly the number of people working in aquaculture in the OECD countries shows a mixed picture. In some countries (*e.g.* Turkey, Norway and Greece) the number of people working in this industry has increased while in other countries it has decreased (*e.g.* Spain and the Czech Republic) (Figure I.15).

Box 1.1. **Decommissioning schemes in OECD countries**

In 2008, the OECD published a Council Recommendation on the design and implementation of decommissioning schemes in the fishing sector (OECD, 2008). Those recommendations were based on an extensive study by the OECD's Fisheries Committee on decommissioning schemes leading to a set of best practice guidelines identifying key areas that policy makers need to be addressed when designing such schemes.

Looking at data for individual countries shows that fleets keep decreasing both in number and tonnage. Whether and how the Council Recommendation has influenced the implementation of such schemes remains to be studied in depth.

Several countries have however undertaken measures which are in line with the recommendations.

Belgium has put in place a fleet adaptation scheme where public funding helps fishers replace main engine or fishing gear, provided that the engine capacity is reduced by a minimum of 20%. This system was implemented in 2009 through decommissioning grants. Vessels could be decommissioned, adopted for alternative activity or partially decommissioned. If vessels were partially decommissioned the remaining capacity could be transferred to a new vessel.

Denmark has also experienced a drastic reduction in fleet size and capacity. Between 2000 and 2008, the number of vessels declined by 15.2% and the tonnage by 30.8%. The Danish authorities have relied on ITQs for an automatic reduction of capacity but also on limiting the number of fishing licenses. Furthermore, Danish authorities have followed a strict policy of not allowing new vessels to enter the fleet without the exit of similar vessel capacity. This is done to avoid investment and modernisation of the fleet resulting in more capacity and is in line with the OECD Council Recommendations. In 2009, a temporary decommissioning scheme was introduced in order to increase energy efficiency. The target was a 5% reduction in fuel consumption of the fleet. This scheme was based on EU Regulation and done in consultation with the industry. Vessels with energy costs exceeding 30% of production costs could apply for financial aid. Applications for aid were selected on the basis of how much energy would be saved.

Finland implemented different decommissioning schemes in 1997-99, 2004-06 and again in 2009. The first plan resulted in a reduction of 827 GT, the second one in a reduction of 1 430 GT and in 2009 the result was a reduction of 245 GT.

In Germany, new vessels can only be introduced if old vessels of same tonnage and engine power are permanently decommissioned. This ensures that the fishing capacity of the German fleet does not grow. At the same time, the capacity ceiling established by the European Commission for Germany has not been fully utilised. Looking further back, there has been a considerable reduction in the number of vessels, 24% since 2000.

Italy has seen a drastic reduction in the number of vessels: 23.5% since 2000 with an accompanying but lower reduction in tonnage. In 2009, Italy implemented some 20 adjustment plans defined by fleet segments and geographical areas. For trawlers, the target is a 12.5% reduction in GRT, while for the Bluefin tuna purse seine fishery the goal is to reduce GRT by 75% by 2011.

The Dutch fleet decreased by 11% in 2008 compared to the year before, mostly due to a decommissioning scheme. The total cost of the decommissioning scheme was EUR 27.5 million and was financed by the European Fisheries Fund.

In Norway, traditionally state-funded decommissioning schemes have been used to reduce fishing capacity. Since the early 1980s, however, different schemes for transferring

Box 1.1. **Decommissioning schemes in OECD countries** *(cont.)*

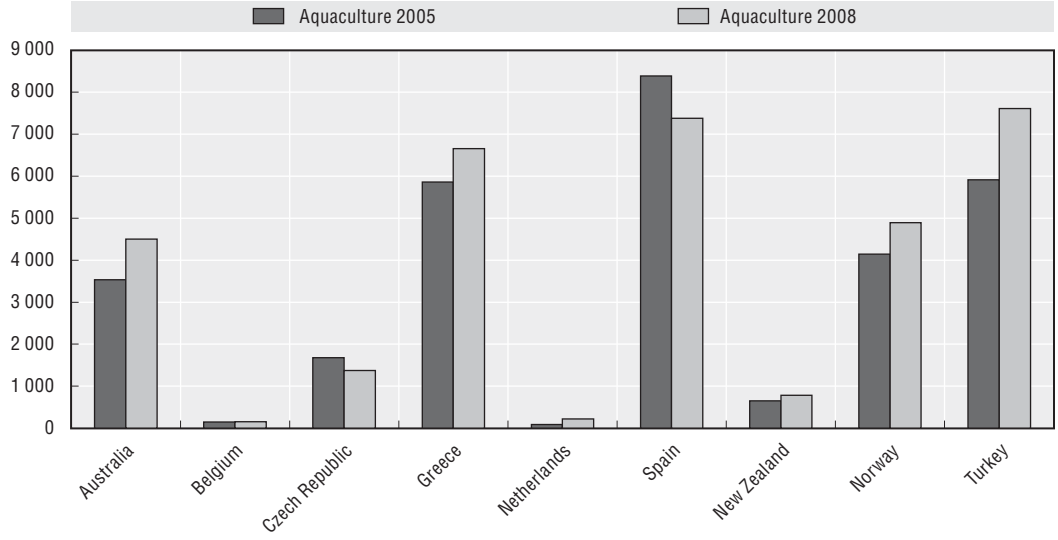
quotas between vessels have been applied to the long distant fleet and later to the coastal fleet, which have resulted in considerable reduction of capacity. An evaluation of the use of structural quotas concludes that this system has been more effective in decreasing capacity than traditional decommissioning schemes.

Sweden has an operational programme to reduce fleet capacity with measurable targets and a pre-determined timetable. Decommissioning measures have been implemented for the bottom trawler fleet and the cod fishery. Pelagic trawlers and purse-seiners on the other hand have been issued Individual transferable quotas which should result in the voluntary reduction of over-capacity through economic incentives. Already the number of vessels in Sweden has declined by 25.3% and total tonnage by 16.6% since 2000.

The United Kingdom launched a decommissioning scheme of the English inshore fleet in 2008. This resulted in the decommissioning of 65 vessels, removing some 457.3 GT from their fleet.

Although much has been accomplished to reduce overcapacity by OECD countries, there is still is room for improvement. Decommissioning schemes are not only assessed for their immediate impact in reducing fleet capacity, but also by their associated costs and how well they ensure that new latent capacity does not enter the fleet while also taking into account the social aspects of capacity reforms.

Figure I.15. **Number of people working in aquaculture, 2005 and 2008**



A possible explanation for the reduction in aquaculture employment may be relocation of production to lower wage countries. It is also likely that in some cases increased efficiency, for example through innovations, reduces the number of people required to work in aquaculture.

Government financial transfers

Available data for 2007-09 shows a mixed trend concerning total government financial transfers (GFTs). While some countries report a decline between 2007 and 2009, measured in USD, others show slight increases.

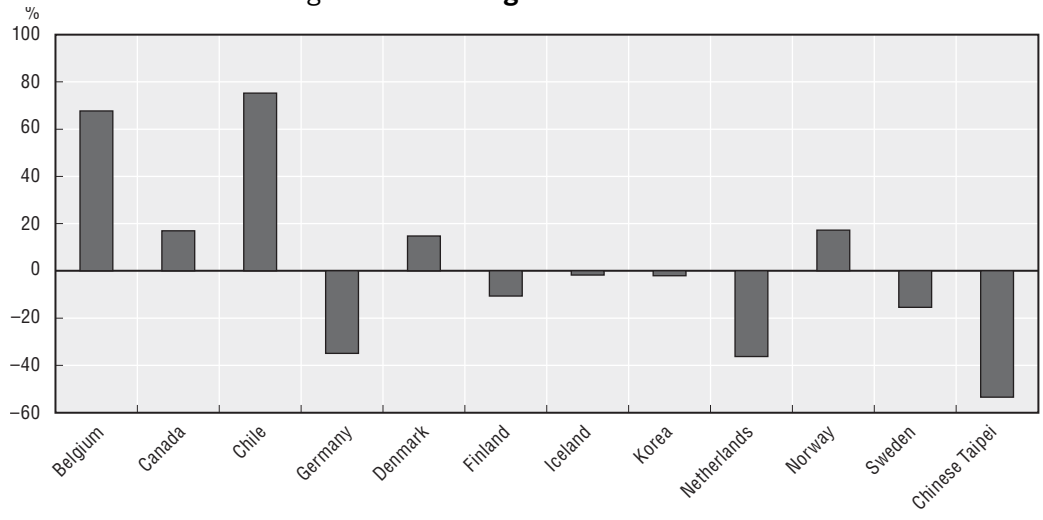
According to available data government financial transfers as a percentage of landed value have increased from 18% in 2007 to 20 and 22% in 2008 and 2009 respectively.

Table 1.1. **Shares of different components of total GFT**

Per cent

	General services	Direct payments	Cost reducing transfers
2007	82.3	12.3	5.4
2008	72.2	21.6	6.3
2009	66.1	25.7	8.2

Figure I.16. **Changes in GFTs 2007-09**



The majority of GFTs are categorised as general services. As can be seen from Table 1.1, there seems to have been a significant change in the composition of GFT in OECD countries in the period 2007-09.

The share of general services, which includes transfers for management, research, enforcement and provision of infrastructure, has been declining while costs reducing transfers and direct payments have been relatively more important. Cost reducing transfers include various subsidies and tax exemptions while direct payments are mainly monetary outlays for decommissioning of vessels and licenses, disaster relief payments, income support and grants for vessel and equipment modernisation and construction.

I.2. Recent developments in OECD fisheries policies

This section describes key developments in fisheries that are of particular policy relevance for OECD countries and non-member economies. Over the past years, a number of reforms have taken place in member countries and new fisheries management instruments have been introduced. There have been notable successes in implementing

reform that can ensure sustainable fisheries and aquaculture. These reforms are important for a number of reasons, for example to ensure better economic returns for fishers based on healthy resources, to generate possible rent for the society, and ultimately to be better positioned to respond to climate change and food security concerns.

Illegal Unregulated and Unreported (IUU) fishing

An EU Council Regulation[2] establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing came into effect on 1 January 2010. IUU fishing has numerous negative effects such as the depletion of fish stocks, habitat destruction, distorts competition and puts those that abide by law and regulations at a disadvantage. Hence, the European Union has put great efforts into deterring IUU fishing and the new rules seek to enforce those efforts. Key aspects of the new system are:

- Only those fisheries products that are validated as legal by the relevant flag state or exporting state can be imported to or exported from the European Union.
- The European Union has compiled a black list of IUU vessels and states that do not adequately tackle illegal fishing activities.
- EU fishing operators that engage in IUU fishing, irrespective of where or under which flag face substantial penalties proportional to the value of their catches which make such IUU activities unprofitable.

The setting up of a certification scheme to validate fisheries products is an important part of the new regulation. The validation scheme applies also to imported products and places importance on the checking, inspection and verification of imports. The reporting process helps in mapping out the transition from the raw materials used and the final fisheries products used for consumption. The transparency established by this system, coupled with linking health certificates to approved processing plants, also helps the implementation of the EU's health legislation.

In March 2008, the EC informed developing countries about the working and implication of the new legislation and analysed the possible consequences for exporting nations. To minimise negative effects of the new legislation on developing countries in particular, specific actions were taken to help those countries that lack the necessary resources to fight IUU fishing.

At the international level, representatives from 92 countries agreed in November 2009 on a text for an *Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing*. This work has been coordinated by the FAO and the agreement will enter into force 30 days after being adopted by 25 countries. As of November 2010, 16 nations have signed this agreement.

The Port State Measures are requirements by a port state to which a foreign fishing vessel must comply. Requirements `may include prior notification of port entry, restrictions on port entry and landing/transhipment of fish as well as document requirements and port inspections. A novelty of this agreement is that it enlists both non-flag states and flag-states, with the latter ones being responsible for the behaviour of the vessels flying their flag on the high seas.

The Port State Measures agreement is a major step forward in the fight against IUU fishing by making it more difficult for such catches to be brought to the market and thereby removing the main incentive for such illegal and irresponsible behaviour.

The FAO is also setting up a database to monitor designated ports, and which will make information regarding best practices available to different stakeholders and civil society worldwide. This will help national capacity building for the adoption and implementation of Port State Measure to fight IUU fishing.

Major policy reforms

The 2002 reform of the Common Fisheries Policy (CFP) put emphasis on longer-term results of fisheries management as well as introducing an ecosystem management approach. The CFP seeks to ensure the sustainability of marine resources. It makes use of the precautionary principle and aims at minimising the negative impact of fishing activities on the marine ecosystem. The 2002 CFP included a ten-year revision clause.

In 2008, the European Commission began the process of a revision of the Common Fisheries Policy (CFP). This revision is based on an empirical analysis of the achievements and failures of the current policy as well as analysing alternative fisheries management models to identify how the CFP may be improved.

The revision process is now well underway. In April 2009, the European Commission published a Green Paper on the reform of the CFP highlighting the challenges of reform. Following the publication of the Green Paper a general consultation process was put in place where fishing sector stakeholders, as well as the public at large, had the opportunity to express their views and contribute to the dialogue on the CFP reform. The results were made public in 2010. In 2011, the European Commission will prepare a legislative proposal in time to be adopted by the EU Council and implemented by 1 January 2012.

The European Commission is moving in the direction of a more decentralised fisheries governance system, thus reducing the central control by the Council of Fisheries Ministers. With the new approach, the principles will be decided at Community level while the day to day implementation is left to regional authorities.

The reform aims to further involve the sector stakeholders in the management procedure and the implementation of the CFP as well as to strengthen the culture of compliance to make the policy more effective. A further objective of the reform is to make the CFP less costly and simpler to run.

Reforming the Common Fisheries Policy touches upon many other issues, such as: the protection of small-scale coastal fisheries, the interaction between fisheries policy and the relative stability principle and improving the correlation between the market sector and the catch sector in European fisheries.

Increased use of rights based management

A number of OECD and non member economies are increasingly using rights based fisheries management instruments. The central role of rights based fisheries management instruments is to introduce an element of "property rights" for fisher's quotas. By doing so the incentive structure changes and makes it more likely that fishers will seek to fish within sustainable limits in order to conserve their "quota capital" for the future. The OECD Committee for Fisheries has recently contributed to this debate; the publication *Using Market Mechanisms to Manage Fisheries* provides a review of a number of fisheries management systems with elements of property rights and maps these according to their property rights content (OECD, 2006).

Box 1.2. **Public consultation on the European Common Fisheries Policy**

According to the base regulation from 1 January 2003, the European Commission (EC) shall report to the Council and the European Parliament on the chapters on conservation and fishing capacity before the end of 2012. The EC started this process with the publication of a Green Paper followed by a consultation period where written comments could be submitted until 31 December 2009. The EC received a total of 382 contributions (and 1 329 identical responses) during this consultation period.

A Commission Staff Working Document summarises the main findings of this consultation process (EC, 2010). They can broadly be classified according to the contents on the Green Paper emphasising the five failings of the CFP.

- Overcapacity of the European fishing fleet remains a problem. Although most contributions acknowledge the importance of the issue many also point out that generalisations should be avoided. Although a reduction is needed there are also cases where renewal and replacement is needed, *e.g.* for safety and environmental reasons. Few advocate a continuation of the current capacity management approach. Many point to rights-based management as a way to reduce overcapacity while at the same time advocate measures to impede concentration of fishing rights. A great majority think that individual transferable rights are not appropriate for small scale fisheries.
- Whether and how priority objectives should be set in the CFP is a matter of dispute. However most agree that ecological sustainability serves as basis for a viable fishing sector. Maximum sustainable yield is seen by most commentators as being an important reference point although views differ on whether it should be used as a target to reach or as a point of direction.
- There seems to be a general support for focusing the decision-making framework on core long-term principles rather than use top-down and micro-management aimed at short-term goals. Many believe that regionally long-term management plans should be adopted. Regional Advisory Councils should be should be strengthened with adequate funding and more weight should be given to their advice.
- Some argue that industry should be encouraged to take more responsibility in implementing the CFP, but only after taking into consideration various issues, including national specificities due to different legal frameworks. Industry itself cautiously supports increased self-management given that the responsibility of failure is not passed on to the fishermen. Self-management would rather give fishermen power to decide on the best technical solutions to achieve agreed targets. Most environmental NGOs are reluctant to support self-management and prefer participatory or co-management approaches.
- Non compliance and a lack of playing field are blamed on fleet overcapacity, complexity of rules and regulations as well as data collection problems and inadequate and varied sanctions. In spite of some reservations regarding a larger role for the Community Fisheries Control Agency, this agency is generally positively evaluated. Views are divided on whether stronger links should be made between financial assistance given and compliance of CFP rules and control obligations.

There are many other important issues that came up in those consultations. The importance of small scale fisheries was highlighted with a strong support for special measures for those fleets due to their socio-economic importance in many regions. Many contributions called for a flexible approach due to the specificities of those fisheries. Relative stability gains large support as it is considered to provide security and stability, especially for many coastal communities. Trade and market issues include the role of POs

Box 1.2. **Public consultation on the European Common Fisheries Policy** *(cont.)*

and a widespread acknowledgement for the need to revise the price and intervention mechanisms. Labelling and certification are considered to be important tools to enhance transparency and build consumer confidence.

Those and other main findings of the consultation process were published on the EC website and following further consultation with both stakeholders and member states it is expected to feed into the policy options for the Impact Assessment that will accompany proposals for the reform of the CFP.

Source: EC (2010).

During the reference period for this *Review*, Denmark and Sweden undertook major fisheries management reforms based on the use of market based instruments.

Since 2003, Denmark gradually introduced ITQs in pelagic fisheries and has been using ITQs in the demersal fishery for human consumption since 2007. The introduction of ITQs was a shift in management from a system of strong entry restrictions combined with IQs which were put in place in 1993.

The new Danish ITQ system is based on vessel quota shares (VQS). Those shares are transferable within certain limitations. At the same time there is a limitation on kiloWatt-days for each vessel.

The introduction of a rights based management system has had wide-ranging effects on the Danish fisheries sector. Table 1.2 shows the evolution of the fishing fleet from 2003 to 2009. The number of boats has decreased substantially in all vessel size categories.

Interestingly, as seen from Table 1.2, the largest relative reduction has been in the number of bigger vessels (18-40 m) while the relative decrease in the number of smaller boats has been less pronounced.

Table 1.2. **Number of vessels in the Danish fisheries (2009)**

	< 12 m	12-15 m	15-18 m	18-24 m	24-40 m	> 40 m	Special fisheries	**Total**
2003	2 518	269	169	167	138	40	268	**3 569**
2004	2 320	263	155	153	124	43	348	**3 406**
2005	2 097	270	150	143	118	40	447	**3 265**
2006	2 049	247	148	120	101	38	431	**3 134**
2007	1 977	213	123	103	79	35	427	**2 957**
2008	1 955	194	116	100	73	30	422	**2 890**
2009	1 963	180	109	86	58	28	410	**2 834**

Source: Fødevareøkonomisk Institute (2010), *Economic Situation of the Danish Fisheries*.

With the changes well implemented, the economic results of the Danish fleet have improved. The profitability of the fishing industry rose from 9 to 20% in the years 2007-08 and investments doubled as old vessels were replaced with new ones and gear up-graded, with fishers focusing on value rather than volume of catch.

Sweden introduced an ITQ system for several pelagic fisheries on 1 November 2009. From that date licensed fishers have been allowed to transfer their quotas. From November 2010, the Swedish Board of Fisheries will decide annually how much of the

national quotas will be put under the ITQ system and how much will remain non-transferable. The new ITQ system was introduced in the following fisheries:

- Mackerel and herring in the Norwegian Sea, North Sea, Skagerrak, Kattegat and the Baltic Sea. Sprat in Skagerrak, Kattegat and the Baltic Sea.
- Blue whiting, Great Sand Eel and industrial species in the Norwegian zone in the North Sea.

Integrated oceans management: A wider approach to tackling issues of the oceans

There has been a recent trend towards a more holistic approach to the management of oceans and aquatic resources. Fishing is just one of many activities that take place in the world's oceans. This move has taken place against the background of increasing use of ocean resources and space and the appearance of climate change impacts. There are a number of often conflicting uses which call for a more holistic approach to oceans management.

Integrated oceans management (IOM) is closely linked to ecosystem management and the two concepts are often used as synonyms.[3] Both approaches are based on the principles of sustainability and biodiversity. While ecosystem management often emphasises biodiversity, integrated oceans management focuses more on how different users of the ocean ecosystem interact. The ocean provides inputs and services for numerous activities such as the following.

- *Habitat for people, plants and, animals*. The oceans are home to numerous animals and plants and while the exact number of different species is hard to assess, it far exceeds their number on land. Approximately 80% of the world's population lives less than 60 miles from the coast.
- *Source of food*. Fish is the major source of protein. However, many commercial fish stocks are overfished with resulting loss in benefits and welfare due to poor management of the fish resources (World Bank, 2009). The oceans are not only a source for wild caught fish but also an important location for expanding marine aquaculture production.
- *Transportation and trade*. For millennia the oceans have been used for transport of goods and people. The bulk of long distance transportation for world trade of goods is done by freighters on international shipping routes.
- *Mineral extraction*. There are various possibilities of extracting minerals from the ocean bed itself. For example, dredging is an important industry. The coastal areas are also an important source of gravel for which demand has been growing rapidly along with the world's construction industry.
- *Oil and gas extraction*. As technology advances along with increased demand for oil and gas, extraction from the sea bed is increasing rapidly. Some of the richest oilfields in the world are found on the ocean floor and are currently being explored.
- *Dumping and waste*. The oceans are used as dumping sites for various wastes, both legally and illegally. For example, the "Great Pacific Garbage Patch" in the North Pacific Ocean accumulates a huge amount of litter, covering a surface estimated to be at least equal to the size of Texas.
- *Tourism and recreational activities*. The coasts are popular tourist destinations with numerous opportunities for recreation and relaxation. Recreational fisheries are an important economic activity for many local communities.

- *Cultural significance*. The world's oceans are the last no-man's territory on earth and a common heritage of all mankind. It figures prominently in various cultures and religions and has been an inspiration for writers, painters, musicians and artists for centuries.
- *Climate change*. The oceans play a vital role in affecting the earth's climate. It has been estimated that the top ten feet of the world's oceans hold as much heat as the rest of the atmosphere.

Some ocean management issues are local, such as pollution or user conflicts while other issues are global, such as climate change and transport. Local issues can be dealt with at national level or by using agreements among adjacent countries while global issues must be tackled at the international level.

As the list of ocean related activities above shows different users of the world's oceans often have conflicting interests. Most ocean related activities have direct impacts on the health and sustainability of the ecosystem. While a major challenge the aim of integrated oceans management is to reconcile different interests to ensure sustainability and biodiversity. The tools are numerous but there are nevertheless some necessary preconditions that have to hold for those tools to be applicable.

Steps towards IOM at the international and national level

Several steps have been taken at international level to address ocean issues. The 1982 UN Convention on the Law of the Sea (UNCLOS), which came into force in 1994, had wide ranging impacts. In particular, the introduction of a 200 miles Exclusive Economic Zones (EEZ) for coastal states recognised a certain freedom of the high seas.

Other treaties have been signed that address issues like pollution and overfishing. The 1995 UN Fish Stocks Agreement stipulates an ecosystem approach based on the precautionary principle for managing various international fisheries.

At the national level, many OECD countries have been at the forefront in taking a broader approach to managing the oceans and the services they provide. Some of those efforts are noted below but the list is far from being exhaustive.

Canada is somewhat of a pioneer in adopting and implementing integrated management for ocean resources. The Oceans Act entered into force as early as 1997 although the concept had been applied by coastal communities well before that date. Canada has identified five geographical areas, called large ocean management areas (LOMAs) to be managed through such an approach. In each of these areas various stakeholders work together to create a long-term management plan. The participation of all interested stakeholders is a crucial element in the integrated management approach as it brings to the table different users. The process for the management of each LOMA is pre-defined with roles and responsibilities of each stakeholder. The management process can be divided into four steps. In the first step the planning process is initiated. Committees are formed to deal with various issues, supported by scientific expertise. In the second step relevant information concerning the ecosystem as well as social, economic and cultural aspects is collected and disseminated. In the third step management objectives are set taking into consideration the different considerations of various stakeholders while at the same time ensuring the health of the ecosystem. In the final step the integrated management plan is developed and implemented for this specific area. The management is an adaptive process which calls for consistent monitoring of the plan and its effects.

On 20 July 2010, US President Barack Obama signed an executive order to establish a National Policy for the Stewardship of the Ocean, Coast and Great Lakes. This makes the restoration of coasts and oceans a top priority for all federal agencies that are involved in managing marine resources. The executive order creates a National Ocean Council which will implement the new policy. This new policy has been in the make for over a decade and has involved discussions with various stakeholders. The US administration is further proposing a new bill, the CLEAR Act, which will help to further safeguard oceans from catastrophic environmental events and establish an ocean investment fund to finance projects that protect, maintain and restore ocean and coastal ecosystems.

The European Commission has been working on an Integrated Maritime Policy (IMP), first proposed in the Blue Paper in 2007. Maritime Spatial Planning (MSP) is the key instrument/tool for the implementation of the Integrated Maritime Policy. Maritime Spatial Planning is designed as the process leading to the development of a maritime spatial plan which maps where different maritime activities take place. The aim of the MSP which cover all maritime sectors is to allow for a more rational use of the sea and improve decision making. Implementation of the MSP is the responsibility of Member States while the EU level helps with co-ordination and in setting the ground rules. The aim of the MSP is to allow for a more rational use of the sea and improve decision making.

New OECD member countries and key partners

During 2010, negotiations were successfully concluded with Chile, Estonia, Israel and Slovenia on their accession to the OECD and at the time of the release of this *Review* they will all be full members of the OECD. Discussion with the Russian Federation is on-going. The OECD Committee for Fisheries reviewed the fisheries sector of Chile and Estonia (OECD, 2009b; OECD, 2009a), and similar work is on-going with the Russian Federation.

Concurrently, the OECD has been increasing its efforts to engage Brazil, China, India, Indonesia and South Africa on policy issues of mutual interest. As dynamic emerging economies are becoming major economic players and trading nations, OECD countries have recognised the need for the Organisation to become more open and inclusive. In May 2007, the OECD decided to strengthen co-operation through key partnerships, "with a view to potential membership," with these five major economies and to expand its relations with regions of strategic interest, starting with Southeast Asia. Key developments from these countries are reported on below.

New OECD member countries

Chile

Chile has emerged as one of the major players in world fisheries and aquaculture over the past decade. It is ranked fifth in the world in terms of production from capture fisheries and seventh in terms of aquaculture production. It is also the seventh largest exporter of fisheries products.

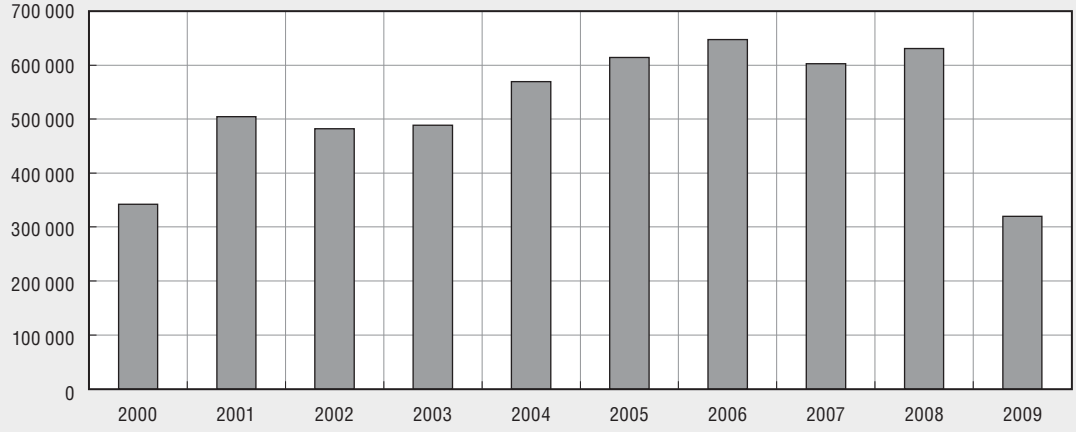
Chile's evolution as a fishing nation has followed an interesting trajectory and many Chilean fishing and aquaculture companies are now leaders on the world stage. However, the evolution has not been without its problems. Resource crises in the pelagic fisheries in the 1990s presented major challenges to companies and communities engaged in marine capture fisheries. Artisanal fisheries remain a difficult problem and current policies have not yet successfully dealt with overexploitation of coastal fisheries resources or provided stable livelihoods to coastal populations.

Box 1.3. **Virus outbreak in Chilean farmed salmon**

The Chilean salmon industry experienced a virus (infectious salmon anaemia) outbreak in 2007, which got worse in 2008. Other salmon producing countries, such as Norway and Scotland have experienced the same type of virus outbreak some years earlier but with less harmful effects. Chile, being one of the biggest producers of farmed salmon in the world, was hard hit by this disease with companies going bankrupt and people being laid off. Various observers have blamed poor environmental management for being responsible for this outbreak while industry leaders stress that the virus infection is not harmful for human consumption. One reason for the swift distribution of the virus has to do with a high number and concentration of net pens used in the salmon aquaculture in Chile.

The development of the Chilean salmon farming industry has in many ways been a success and production has increased at an impressive rate over the last two decades. The main markets for Chilean salmon are Japan, United States and Europe. Since 1990, the production, by volume, has increased more than 20-fold. Such rapid growth requires a strong regulatory and operational framework. In 2005, the OECD pointed out that the Chilean salmon farming industry should have been improved in many ways especially with regards to high rate of escapes, lack of control of fungicides and too much use of colorants while at the same time pointing out to excessive use of antibiotics (OECD, 2009a).

Aquaculture production in Chile



Source: FAO FishStat Database.

Aquaculture, mostly salmon and trout, is one of the most important export industries in Chile, surpassed only by copper, fruit and wood pulp and for many regions aquaculture is the main economic activity. In 2008, which was a record year, Chile exported 445 000 tonnes of salmon and trout with export earnings close to USD 2.4 billion. This was a considerable increase in volume from 2007, when around 397 000 tonnes were exported but one of the reasons for this increase was that harvesters were eager to harvest early to avoid ISA. Production in 2009 fell to around 320 000 tonnes and USD 2.1 billion in export value and is expected to fall even further in 2010 with an export value of around USD 1.3 billion.

Also as a result of the virus outbreak the number of Chilean salmon farms has dropped significantly. They were 374 in 2007, 298 in 2008, and their numbers fell drastically to around 174 in 2009 as the virus spread.

The Chilean experience underlines the importance of having a regulatory framework in place that is capable of dealing with the numerous economic, environmental, social and health issues that arise when the industry reaches this size and intensity. The Chilean government is currently working on a new legislation to govern the salmon farming industry. It benefits from the lessons learned by Norway, Canada, Scotland and the Faroe Islands who have all had to fight the same virus.

It is clear that lessons from Chile's experience provide useful insights that can be applied to both OECD and non-member economies. Chile has been through an intense, challenging and complex learning process which is reflected in the evolution of its fisheries and aquaculture policies. The strong institutional foundations underpinning the sector have helped Chile to weather the crisis and move forward. In many areas, Chile's policies reflect sound policy principles and strong institutional foundations including, for example, the relative absence of subsidies in the sector, the use of market-based fisheries management approaches, and a sound scientific basis for decision making.

Estonia

The Estonian fishery sector has undergone drastic changes since the country's independence following the collapse of the Soviet Union in the early 1990s. The total marine catch dropped from around 400 000 tonnes in 1988 and has stabilised at around 100 000 tonnes since the mid 1990s. The Estonian commercial capture fishery is sub-divided into four fleet segments; Atlantic distant water fisheries, Baltic trawlers, Baltic coastal fishery and an inland water fishery. The Estonian marine fishery in the Baltic Sea and the Atlantic Ocean is covered by the EU Common Fisheries Policy, since Estonia joined the European Union in May 2004. Estonia is far from being a negligible fishing nation and it has the biggest shrimp quota among the EU countries in the NAFO area.

The transformation of the fishing industry towards a market based economy included *inter alia* the introduction of quotas (ITQs) in the Baltic and Atlantic trawling fisheries and gear quotas in the Baltic coastal and inland fisheries. Most quotas are owned by companies which hire crews to fish on their vessels or by fishers that own their vessels. All fishing rights in Estonia are fully transferable within the country. Access to commercial fishing is subject to a fee which is used to cover such expenses as fish stock research, surveillance, restocking, and data collection.

The coastal and inland fisheries use mainly passive gear and use a multitude of small ports which make it difficult to control and observe catches. For this reason, it was decided to use gear quotas in those fisheries. There are, however, agreements with the Russian Federation concerning the most important commercial species in the Lake Peipsi-Pihkva were national (block) quotas have been set. There are around 2 600 coast fishers in Estonia, but on average they make only 10-20% of their income from fishing (OECD, 2009b).

In addition to catch and gear quotas, there are numerous technical management measures used in the Estonian fisheries such as minimum mesh sizes, closed areas and seasons, minimum landing sizes for fish and limits on by-catch.

A baseline study by the Estonian Marine Institute (2005) estimated that overcapacity of the trawling fleet was around 30%. Accordingly a decommissioning scheme was put in place in 2005-06. According to the Operational Programme of the European Fisheries Fund 2007-13, the Estonian national fleet is still dominated by fishing vessels built in the 1970-80s, characterised by low-quality steel and weakly functioning engines. Another adjustment scheme was planned in 2007 and is still ongoing aimed at reducing overcapacity while at the same time modernising the fleet. This vessel adjustment plan is in accordance with the OECD "Recommendation of the Council on the Design and Implementation of Decommissioning Schemes in the Fishing Sector" and corresponds to EU legislation.

Around 20 commercial companies are engaged in fish farming. The main species are rainbow trout (*Oncorhynchus mykiss*), common carp (*Cyprinus carpio*) and European eel (*Anguilla*

anguilla). An important by-product for trout farmers is trout roe which is salted and sold as red caviar. The aquaculture production has been increasing in later years. An important branch of aquaculture is rearing for restocking and activity that is financed by the state.

The Estonian fish processing industry went into decline following the collapse of the Soviet Union but has now more or less stabilised. The main processing method for fish (herring and sprat) is freezing and the products are mainly sold to eastern markets. There are around 90 processing companies in Estonia and there has been a tendency in later years towards bigger horizontally and vertically integrated companies taking care of the whole value-chain from fishing to exporting. Other processing methods, like salting, spicing, breaded and canning have also increased. The most valuable species in the coastal and the Lake Peipsi-Pihkva fisheries, perch and pikeperch, are filleted and sold mostly to western markets.

Recreational fishing is common, both in inland waters and the coastal zones. Generally, angling requires no license and there are no official statistics on landings. A considerable part of recreational fishing is made up of juvenile fish which have not reached legal minimum size. A substantial part of this catch is sold to fish processing companies. There is ongoing discussion on whether and how recreational fishing should be regulated, including a long-term strategy to avoid conflicts between recreational and professional fishers.

I.3. Major emerging economies

Brazil

In 2008, Luiz Inácio Lula da Silva, President of Brazil, signed a bill creating a new Ministry of Fisheries. The new bill changes the former Special Secretariat of Aquaculture and Fishery (SEAP) to a ministry. The new law entered into force on 26 June 2009. This change is not only nominal but reflects the increased interest in the fisheries sector. The new ministry is to have a larger structure than the former Special Secretariat, more employees and increased power. The government has announced that USD 1 billion will be invested in the fisheries sector up to 2011, a five-fold increase from the previous four year period.

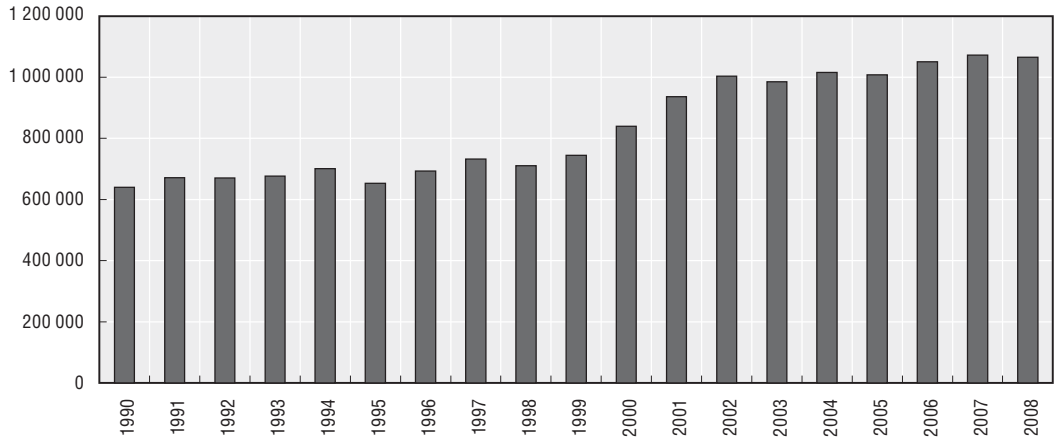
In this regard, the Brazilian authorities have set up an ambitious plan for fisheries sector development. Brazil produces around 1 million tonnes of fish per year for a total value of USD 2.66 billion but according to the new plan the production should reach 1.4 million tonnes in 2011 with 25% of this increase coming from fishing and 75% from fish farming (Figure I.17). Presently most of the fishing activity is small scale and coastal but creates employment for around 3.5 million people.

Brazil, having a coastline of 7 491 km, ranks third in total production volume of the South American countries with around the same production as Argentina. Peru and Chile are the biggest fish producers of the continent, mostly due to their big pelagic fisheries.

There is room for improvement and innovation in the Brazilian fisheries sector, both in marine and fresh water fisheries. Marine fisheries in Brazil have stagnated in recent years, while there has been an important increase in aquaculture production.

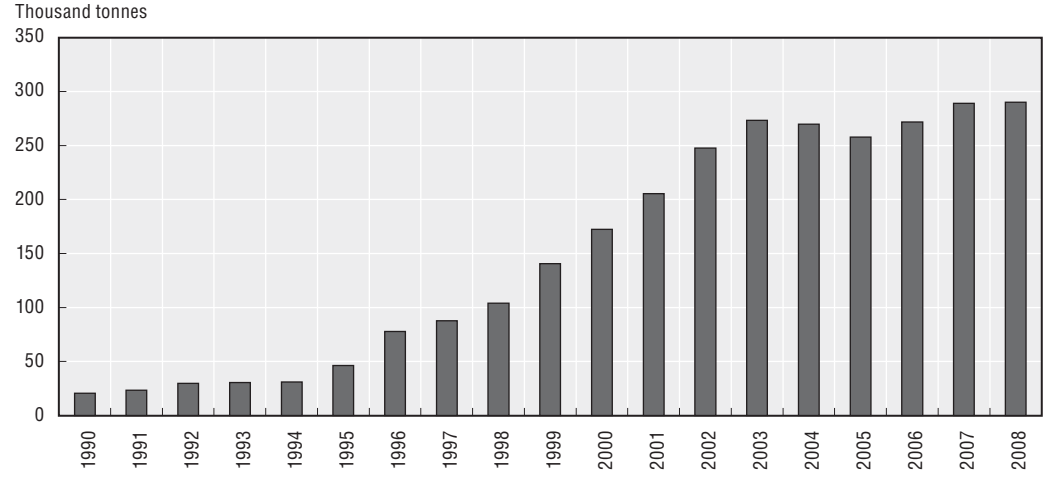
According to the new plan the government will invest in infrastructure such as port facilities, ice facilities and storage centres while at the same time opening up credit-lines for fishing companies and fishers. At the same time effort will be made to increase fish consumption in Brazil, especially among children.

Figure I.17. **Fish production in Brazil**



Source: FAO FishStat Database.

Figure I.18. **Aquaculture production in Brazil**



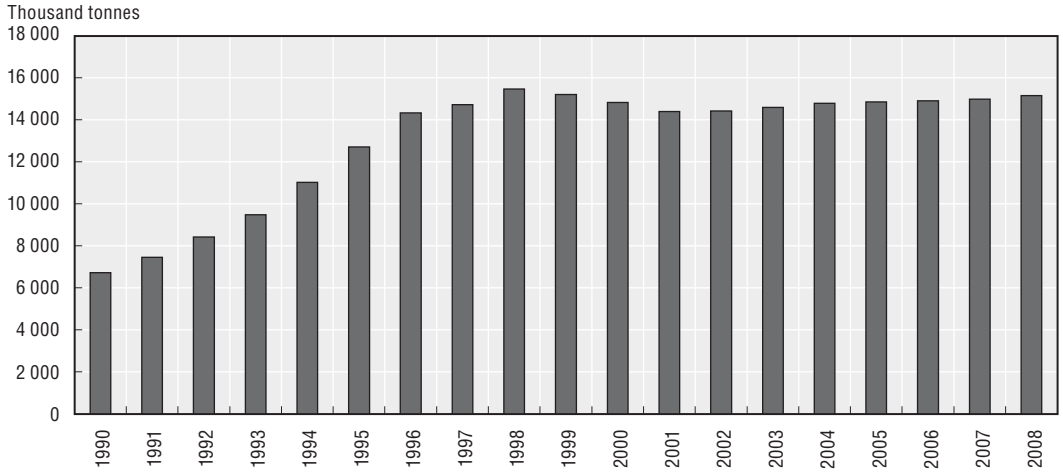
Source: FAO FishStat Database.

The new ministry is responsible for the management of the fish resources in cooperation with other ministries such as the Ministry of Environment. This includes monitoring, controlling and surveillance (MCS), which has not been given sufficient weight until now. To strengthen the MCS activities the government will invest USD 17 million in new fisheries patrol vessels. The Brazilian authorities are well aware of the fact that too much fishing may boost the industry temporarily, but will have negative effects in the long run. The new plan aims for sustainable use of Brazil's fisheries resources.

China

China is the biggest fishing and aquaculture nation in the world accounting for roughly a third of the world capture fisheries catch and two-thirds of the aquaculture production. The total Exclusive Economic Zone measures 3.53 million square kilometres and the total fishing grounds cover an area of around 2.78 million square kilometres of which roughly 1.47 million square kilometres are continental shelf, *i.e.* less than 200 metres in depth.

Figure I.19. **China's capture fisheries production**



Source: FAO FishStat Database.

Following a period of impressive growth, marine catches have somewhat decreased in the last decade. In 2004, the marine capture fisheries contributed 14.47 million tonnes, which was almost half a million tonnes less than in 1999. There are more than 3 000 species found in Chinese waters, of which 150 are of commercial importance.

The industry is comprised of many small scale fishers and fewer but much bigger state owned enterprises. In 2004, the total number of vessels was estimated to be around 280 000. The small scale fleet fishes around 90% of the total catch. Recently there has been a trend toward modernisation of the state owned enterprises with a separation between ownership and management.

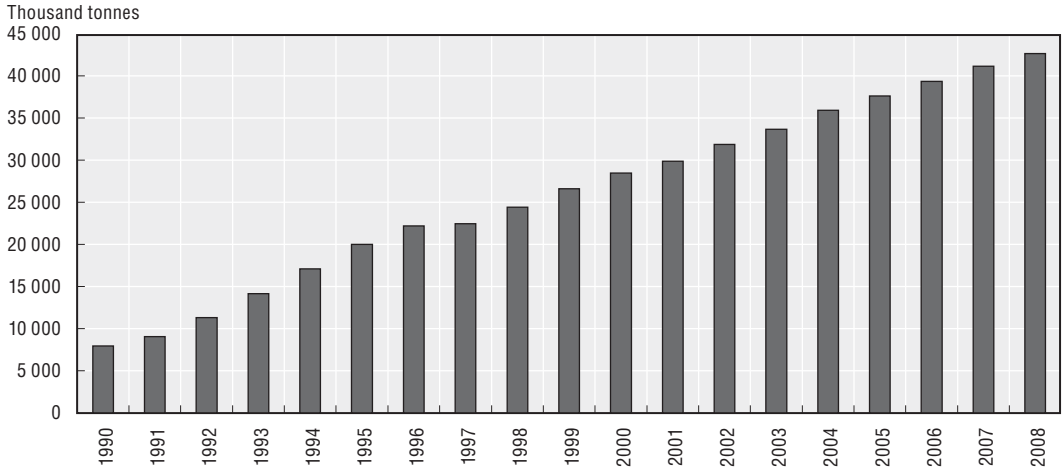
The stagnating marine catches are to a large degree due to overfishing with accompanying reduction in efficiency and profitability. The Chinese Government has responded to this trend, including for example by decreasing the number of vessels through a decommissioning scheme. In 1999, the government put forward a plan of *zero growth* in the marine fisheries. In February 2006, the government issued a *Programme of Action on conservation of Living Aquatic Resources of China* which aims at reversing this trend by using various measures such as reducing by-catch and overcapacity as well as increasing the number of endangered species which are given specific protection. Input controls and seasonal closures are also used to rebuild declining fish stocks and industries.

China has a long aquaculture history and the industry has been one of the fastest growing in the country in recent years. In 2003, aquaculture production reached around 30.28 million tonnes. Aquaculture is important both for domestic markets and as an export industry. Most of the fish sold on the domestic market is sold live, due to the strong preference for freshness. The main species for exports are shrimp, eel, tilapia, shellfish and seaweed. The biggest export markets are United States, Japan and South Korea.

The aquaculture industry directly employs around 4.5 million people with an additional 6 million people employed part-time. Most fish farms are privately or collectively owned and there is a high proportion of women among people working in the industry.

The rapid expansion of the Chinese aquaculture industry has led to problems associated with increased intensity of production. Pollution and disease outbreaks are common problems. The government has responded, both in the review of the Fisheries Law

Figure I.20. **China's aquaculture production**



Source: FAO FishStat Database.

from 2000 and by setting regulations on *Quality and Safety Management* for aquaculture in 2002. The new regulation is intended to strengthen sustainability and increase responsibility in the industry.

In addition to capture fisheries and aquaculture, given the size and number of numerous lakes and rivers, inland fisheries are quite important in China. Various carps, salmon, trout and other fish are harvested along with shellfish, molluscs and aquatic plants and animals.

China appears to have reached a new stage in its development of fisheries and aquaculture. Capture fisheries output can hardly increase and more attention is given to increasing efficiency and sustainability; rapid growth of the aquaculture industry also poses new challenges that will need to be addressed.

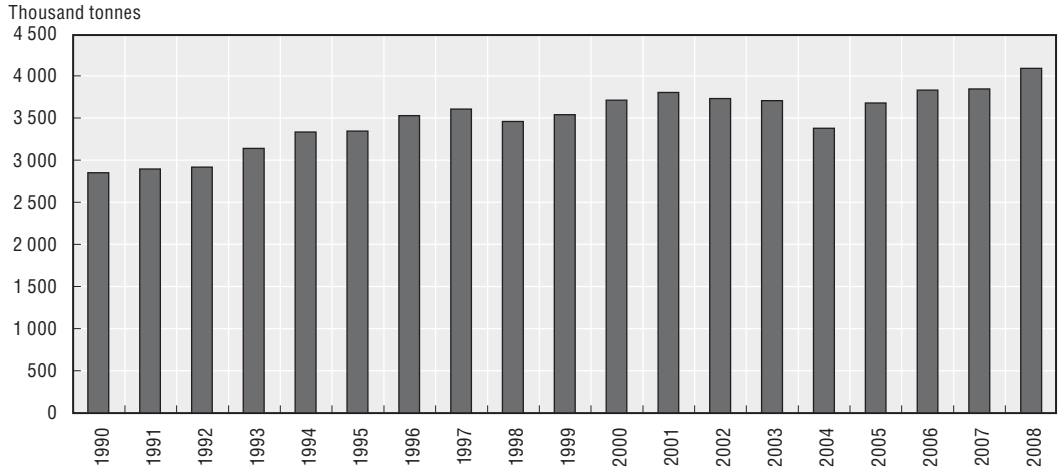
India

It is difficult to obtain reliable data on production of Indian fisheries, not least due to the size and complexity of the industry. Nevertheless it seems clear that there has been a many-fold increase in fishery production since independence and fishing is a major industry in many coastal states. At the same time exports of fish products have grown considerably.

The Indian Exclusive Economic Zone covers around 2 million square kilometres and to this must be added around 14 000 square kilometres of brackish water, 16 000 square kilometres of lakes, ponds and swamps and 64 000 kilometres of rivers and streams.

Production from marine capture fisheries has increased almost steadily from around 2.5 million tonnes in the early 1990s to more than 3 million tonnes in 2008. Inland water fisheries are also important with production around 500 000 tonnes in the 1990s to around 1 million tonnes in 2008. It has been estimated that in 1990 around 1.7 million people are full-time fishers, 1.3 million part-time fishers and that the number of people that fish occasionally is around 2.3 million.[4] In the early 1990s, the fishing fleet was composed of around 180 000 traditional boats using oars and sails for propulsion, 26 000 motorised traditional boats and around 34 000 mechanised vessels.

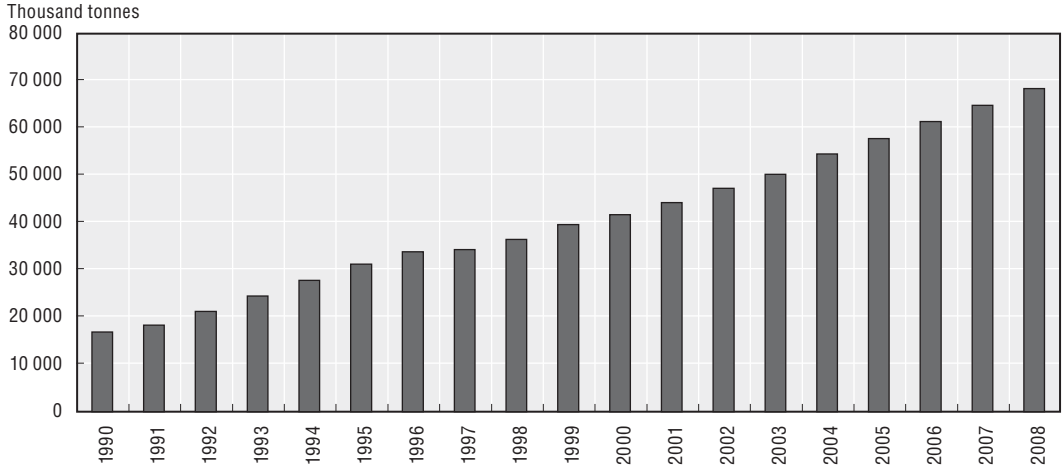
Figure I.21. **India's capture fisheries production**



Source: FAO FishStat Database.

Aquaculture has also increased rapidly in India with produced volume tripling since 1990.

Figure I.22. **India's aquaculture production**



Source: FAO FishStat Database.

According to Indian authorities the Department of Animal Husbandry, Dairying and Fisheries, has set in place various programmes and welfare oriented schemes to increase production and productivity in the fisheries sector. Special effort has been made to promote inland fisheries and aquaculture and it is believed that production from those industries is considerably higher than from marine fisheries.

Indonesia

With marine captures of around 5 million tonnes and an aquaculture production in excess of 3.8 million tonnes, Indonesia is among the major fishing nations of the world.

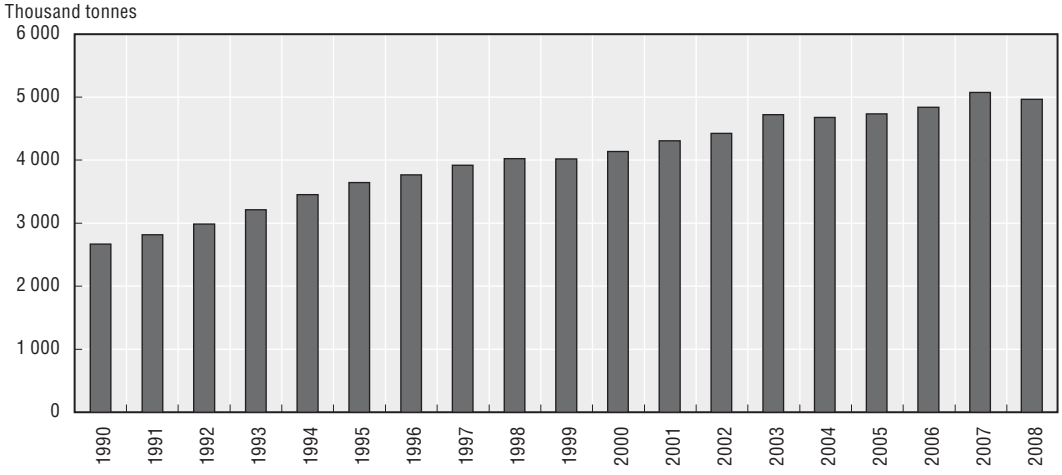
The main species in marine capture fishery are tuna and shrimp. While the catch of tuna and shrimp has not increased significantly in recent years the catch of other species, such as crabs, squid, sardinella and groupers has grown considerably.

The marine resources of Indonesia can be split into four different segments:

- large pelagics, such as tunas, sharks and billfish;
- small pelagics, such as scads, mackerel and sardinellas;
- dermersal and coral reef fisheries, mostly groupers and snappers; and
- prawn, shrimp and other crustaceans.

Marine capture fisheries are managed over nine fisheries areas. According to the FAO, there is intensive exploitation in the western part of Indonesia, while there is room for development in the eastern part. In 2004, there were around 549 100 marine fishing boats of which roughly 46% were unpowered. Outboard powered boats account for around 30% of the fleet while inboard powered boats account for the rest of the fleet.

Figure I.23. **Indonesia's capture production**



Source: FAO FishStat Database.

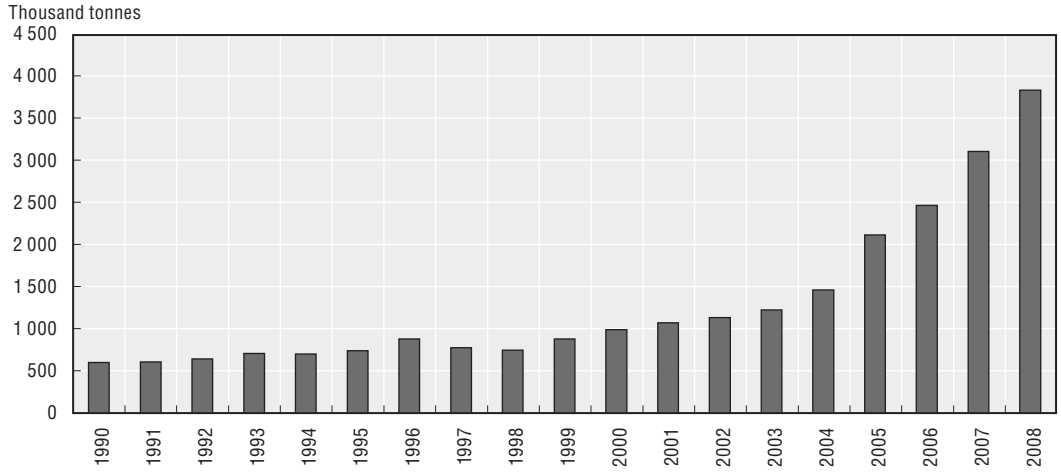
With production levels of more than 3.8 million tonnes in 2008 and employing almost 2.3 million people in 2003, the Indonesian aquaculture industry is of great importance. Around 46% of the total production takes place in fresh water ponds while the use of paddy fields and ponds is also common.

The fishing industry as a whole constitutes an important contributor to the national economy with more than 6 million people directly employed in the industry. Fish and seafood are an important source of protein, especially to poor households. Fish consumption is on the rise and plays a large role in food security.

More than half of the fish sold on the domestic market is consumed fresh as storage and transport infrastructure is limited. The other half is mainly dried, salted, smoked or fermented. There are around 10 000, mostly small, processing plants in the country.

Around 16% of the production is frozen and destined for export. The export revenues amounted to roughly USD 2.2 billion in 2007 with the main markets being China, Thailand, Japan, United States, Singapore and South Korea.

Figure I.24. **Indonesia's aquaculture production**



Source: FAO FishStat Database.

The main challenges faced by the Indonesian fishing industry are overfishing, both in the inland and marine fisheries, low incomes and standard of living for fishers, lack of credit for investments, weak management, monitoring, surveillance and enforcement and last but not least degradation of habitat in certain areas, especially coral reefs.

The government has taken steps which mainly aim at increasing foreign exchange revenues from exports through increasing quality and quantity as well as improving the living standards of fishers.

Given that the domestic market is growing stronger, there seems to be room for important improvements in both processing and marketing. By improving the value-chain of the fishing industry, fisheries can substantially improve the welfare of consumers and fishers alike.

South Africa

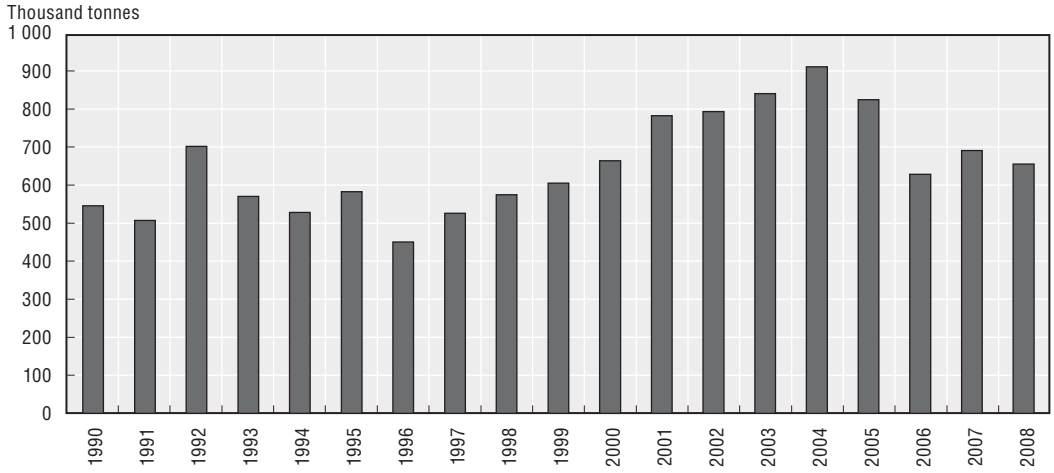
South Africa faces two oceans, the South-Atlantic and the Indian oceans. The cold Benguela current flows northwards along the west coast and the warm Agulhas current southward along the east coast. Those conditions explain the rich diversification of the South African fisheries. While the waters off the west coast are more productive the fisheries off the east coast have a wider variety of species. A characteristic of the South African fisheries is the lack of suitable harbours along the coast, due to geographical circumstances.

The two most important offshore fisheries, both with respect to value and volume are the demersal hake trawl fishery and the small pelagic purse seine fishery which targets anchovy and sardine. Both of those fisheries are primarily based near the west coast from the ports of Cape Town, Saldanha and St. Helena Bay.

Apart from the hake trawl fleet, hake is also fished by demersal longlines and handline which together take around one-tenth of the hake catch with an additional 6% being fished by a small inshore trawl fishery. The hake fishery contributes to around half of the value of fisheries production in South Africa.

The sardine and anchovy fisheries, although with higher catch volumes, contributes to around one-fourth of the production value in the South African fisheries. As is usually

Figure I.25. **South Africa's capture production**



Source: FAO FishStat Database.

the case with such short-lived pelagic species there are important fluctuations in stock sizes which results in variable catches from one year to another.

Crustacean fisheries include a small trawl fleet which targets shrimps and a small fleet which catches lobster using traps.

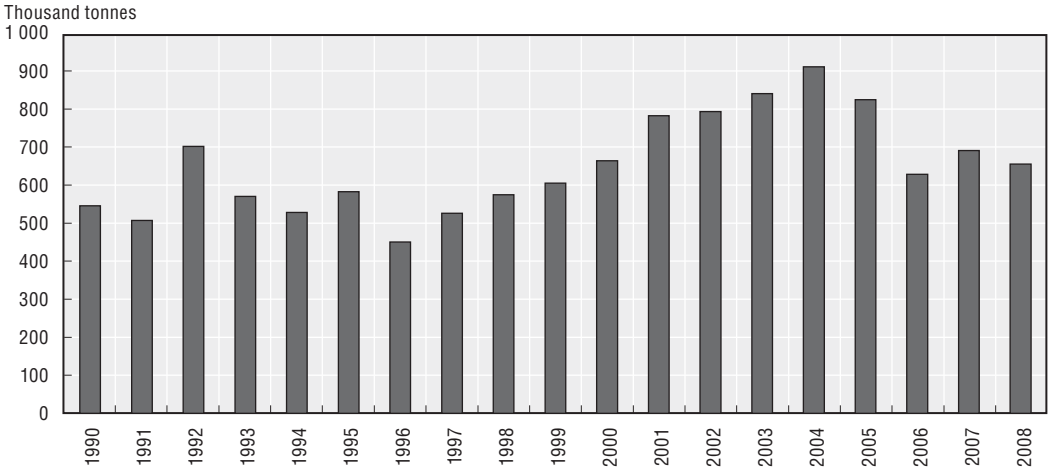
The line-fish sector, although smaller than the hake and the pelagic fisheries in volume and value, is of great importance in the South African fisheries. This is a complex sector with many commercial as well as subsistence and recreational fishers targeting numerous species. It is practiced almost all along the coast and has the highest number of participants and covers the greatest fishing area. Due to a crisis in this sector at the end of the 1990s, a special *Linefish Management Protocol* was set up based on effort management on geographical zones.

South African fishers target highly migratory species such as yellowfin tuna, bigeye tuna, longfin tuna, swordfish and shark on the high seas. The main fishing methods are longline and tuna poles. Historically South Africa granted fishing licenses for those fisheries to foreign countries, mostly from East Asia. Since 2004, these fishing rights have mostly been allocated to South African companies while there are still many foreign flag operators taking part in this fishery under joint venture arrangements. South Africa participates in the work of various Regional Fisheries Management Organisations (RFMOs) to manage those highly migratory stocks.

There is an important recreational fishing sector, both in the marine and inland fisheries. Commercial inland water fisheries are almost non-existent. The aquaculture sector is also fast developing both freshwater and marine farming. The main species are abalone, black mussel, oyster, prawn and seaweed. The abalone farming is the most important and South Africa produces more than one-fifth of all farmed abalone in the world (FAO, 2010).

Most South African fisheries are managed by effort limitations while only nine fisheries are managed solely by TACs. Financial incentives and subsidies are not present.

Figure I.26. **South Africa's aquaculture production**



Source: FAO FishStat Database.

The domestic market for fish is limited to the coastal zones and is not a significant part of the South African diet. The exports are mainly to Japan, Spain, United Kingdom, United States, China, France, Australia and Mozambique.

A survey from 2003 estimated the total number of people directly working in the fishing sector to be 16 854 with additional 10 876 people working in secondary and associated industries (Sauer *et al.*, 2003).

In 2009, the President of South Africa decided to incorporate agriculture, forestry and fisheries into a new Department of Agriculture, Forestry and Fisheries (DAFF). Those sectors were previously under the Department of Water and Environmental Affairs. The mission of the fisheries branch of the new Department is among other things to maintain and restore productive capacity and secure biodiversity of the marine environment while promoting sustainable use of the marine resources. It will also work to prevent degradation of the marine environment from land-based activities.

I.4. Recent activities of the OECD Fisheries Policies Division

The OECD, including the OECD Committee for Fisheries (COFI), celebrated its 50th anniversary in 2011. Over the past 50 years the topics addressed by the COFI reflect the progress of knowledge and the changes in the fisheries sector that has taken place. Fisheries governance and management challenges are dynamic and reflect the particular settings of the fisheries sector and technical developments that have occurred. The initial years were dominated by a supply-driven paradigm, focussing on fishing capacity increases often sustained by a system of Government Financial Transfers.

Major changes in the international fisheries governance framework shifted that focus: the formal introduction of the Exclusive Economic Zones under the United Nations Convention on the Law of the Sea in 1982 reshuffled international production and consumption patterns. In later years, Illegal, Unregulated and Unreported fishing has become more visible while the number of Regional Fisheries Management Organisations proliferated in an attempt to deal with international fisheries that have become accessible. At the domestic and at the international level, rights-based management as opposed to the traditional input-output controls entered the fisheries managers' toolbox.

While many wild fish stock's productive capacity has declined the huge progress in aquaculture technology has helped reverse the supply situation for aquatic protein. And aquaculture is likely to need more attention in terms of governance and management in the future to optimise its contribution in terms of food supply and economic activity.

Economic aspects, in addition to biological ones, are receiving increasing attention in fisheries management. The challenge is to develop holistic management approaches which combine economic, biological and social aspects of fisheries that can deliver sustainable and efficient outcomes. Such management systems have to be embedded in a political economy context that ensures policy coherence and integration with other fisheries and aquaculture related activities.

The following paragraphs provide an overview of the current work streams of the OECD Fisheries Policies Division which deal with: *i)* the economics of rebuilding fish stocks; *ii)* fuel tax concessions; *iii)* fisheries and aquaculture certification; *iv)* climate change; and *v)* aquaculture.

The economics of rebuilding fisheries

Rebuilding fisheries is a challenging task. Governments have had mixed success in designing and implementing effective rebuilding programmes, with a number of high profile successes, as well as notable failures.

The 2002 World Summit on Sustainable Development (WSSD) saw governments around the world undertake to "maintain or restore stocks to levels that can produce the maximum sustainable yield with the aim of achieving these goals for depleted stocks on an urgent basis and where possible not later than 2015." However, progress towards this goal has been slow. FAO data on the state of world fish stocks indicate that 17% of the world's fish stocks are overexploited, 7% are depleted, and 1% is recovering from depletion (FAO, 2009a). A recent FAO/World Bank study estimates that approximately USD 50 billion is lost annually in global resource rent from fisheries as a result of poor governance (FAO, 2009b). Increasingly, the challenge to rebuild fisheries has been taken up at the regional and national level. Nevertheless, some fisheries rebuilding programmes have not delivered on their objectives and rebuilding efforts are generally lagging behind the pace required to meet the WSSD commitment.

In many cases, rebuilding goals are defined solely in biological terms such as MSY, and the design of the paths and instruments to achieve these goals are often driven by biological considerations. Such a focus overlooks the reality that rebuilding programmes are nested within a broader economic, social and political setting. In this context, it is also worth recalling that a distinction can be drawn between *stock rebuilding* and *rebuilding fisheries*; the former is focused more or less exclusively on the species and its habitat, while the latter would extend to the fishing industry and associated communities so as to capture the human dimension as well, and acknowledge the social, economic and governance components of rebuilding. It is the latter which is the focus of the OECD project on the economics of rebuilding fisheries which is scheduled to be completed by late 2011.

While biologically defined goals and commitments such as that made at the WSSD represent a crucial commitment to rebuilding fish stocks, the question of how economic analysis and instruments can be applied towards rebuilding fisheries, including the development of rebuilding goals and timeframes, remains. This holistic approach emphasises that economics has a crucial role to play in influencing the choice of rebuilding

goals, the rebuilding path, the technical and policy instruments used to achieve objectives, and the enforcement mechanisms.

Challenges in rebuilding fisheries

Numerous biological and ecosystem challenges to rebuilding *fish stocks* are well known, and often beyond the control of fisheries managers. For example, attempts at successful rebuilding may be stymied by unfavourable climatic conditions; habitat degradation or destruction may serve as a barrier to stock growth and limit carrying capacity; or even semi-permanent changes or shifts in the ecosystem due to the depletion of one stock, for example by changing the relative composition of stocks (*e.g.* predator-prey relationships).

However, there are several tools and approaches available to fisheries managers to rebuild and maintain vibrant fisheries. To achieve this goal, several policy challenges identified at the Workshop on the Economics of Rebuilding Fisheries, which took place in May 2009, need to be considered and addressed (OECD, 2010a). Several of these key challenges are described below.

Effectively integrating economic considerations in the design of rebuilding plans

Several studies have demonstrated that rebuilding fisheries can yield sizeable economic benefits (World Bank, 2009; Pew, 2009). While some countries have legislation (*e.g.* United States) that requires the rebuilding of fish stocks to levels that support maximum sustainable yield, other countries apply a policy based approach (*e.g.* New Zealand, Australia) which provides more flexibility. Whether a policy or legislative basis underlies a rebuilding programme, considerable benefits can be achieved through the design of rebuilding plans that are in line with the objectives of stakeholders and simultaneously minimise rebuilding costs. Economic concepts such as maximum economic yield (MEY), where the goal is to maximise the economic gains from a fishery, demonstrate that in many cases it will be desirable to rebuild fish stocks greater than the stock size which allows for biological maximum sustainable yield (BMSY) (Box 1.4). Using economic incentives such as those created by individual or group quota systems can reduce rebuilding costs by harnessing the knowledge and skills of fishers to the task of reducing catch rates of a rebuilding stock, and ensuring the long term viability and profitability of a fishery.

Dealing with multispecies fisheries

When a fish stock that is part of a multispecies fishery is depleted and rebuilding is required, the determination of the optimal rate of rebuilding requires taking into account the effect on the net benefit stream for the overall multispecies complex. While it may be possible to alter relative catch rates to reduce or perhaps eliminate catch of a rebuilding fish stock, it will generally be costly to do so. In determining the optimal rebuilding strategy, this should be factored in. It may be that allowing a longer rebuilding schedule with lower initial reductions in catch may be able to meet legal rebuilding requirements while minimising the cost to the large multispecies fishery. The management system and tools used in a multispecies fishery can have large impacts on the cost of rebuilding.

Challenges of international fisheries and fisheries on the high seas

Fish stocks do not respect national boundaries and there are many additional challenges in managing and conserving highly migratory and straddling stocks. From a

Box 1.4. **Calculating MEY: An example from the Australian Commonwealth trawl fishery**

Kompas and Che (2008) have constructed a bioeconomic model of selected stocks for the Commonwealth trawl sector of the southern and eastern scalefish and shark fishery. Solutions to the bioeconomic model are obtained by maximising the aggregated discounted profits over time subject to a specification for harvest functions – the production function mapping fishing inputs to the harvest of fish – and the appropriate stock-recruitment relationship. All initial conditions for biomass are taken from virgin biomass measures provided by CSIRO or estimated from information supplied by CSIRO.

The results of the model are preliminary and the model likely requires further calibration based on biological studies and economic data. The results of the model are in two forms:

- harvests and stocks in steady state (that is optimal harvests after stock rebuild);
- harvests during the rebuild phase.

The preliminary results indicate that for four of the major stocks (orange roughy, pink ling, spotted warehou and tiger flathead) considerable stock rebuilding is required to maximise profits. That is, historical levels of harvest and fishing effort have resulted in current stock sizes that are below the stock level B_{MEY}. Also in the table below, the stock level associated with MEY relative to MSY is shown and for each species B_{MEY} is above B_{MSY}. The optimal harvests at the steady state are also shown in the table below. However, during the rebuild phase, harvests need to be set lower than 2004 catch levels to allow the stock to rebuild to B_{MEY}.

Results of bioeconomic model of the Australian Commonwealth trawl sector of the southern and eastern scalefish and shark fishery

Species	B_{MEY}/B_{CUR}	B_{MEY}/B_{MSY}	Optimal harvest at steady state (MEY) tonnes	Initial harvest TAC during rebuild[1] tonnes	Harvest (2004) tonnes
Orange roughy – cascade	1.64	1.47	995	665	1 600
Spotted warehou	1.30	1.08	4 117	3 114	4 100
Pink ling (trawl)	1.80	1.29	1 397	914	1 073
Tiger flathead	1.05	1.03	3 830	2 980	3 200

1. This is the initial TAC during the rebuild phase. The TAC will increase through time over the rebuild period up to the optimal TAC at steady state.

Source: Gooday *et al.* (2009).

governance perspective, there are many issues related to the effectiveness of monitoring, enforcement, fisheries policies, treaties and agreements, the effectiveness of Regional Fisheries Management Organisations (RFMOs) and their stewardship of fisheries in the high seas. The key to effective international arrangements for sustaining and rebuilding fisheries populations involves both clear objectives and mutually agreed science and the political will to implementation to achieve sustainability and rebuilding objectives, with a common and shared vision (Davis, 2010).

Role of stakeholders in the rebuilding process

Rebuilding affects a broad set of stakeholders including industry, consumers, policy makers, environmental organisations and the research community. Distributional issues

influence the strategies employed to rebuild overfished stocks. Distributional issues are embedded in the management context, history, structures and processes, and through these, influence the identification and implementation of rebuilding strategies and stakeholder's willingness to engage in rebuilding. How costs and potential benefits of rebuilding are distributed among different stakeholders can thus play a decisive role in the success or failure of a rebuilding plan. Within a single fishery distributional issues exist between user groups, for example commercial and recreational, gear types or functional groups such as harvesters, processors and communities. They exist in space between geographic subsectors such as fishing areas, ports and regions. They exist across time between present and future fishery interests. Management typically attempts to address the distribution of the resource among industry sectors and functional groups. Strategies to rebuild overfished stocks expand the consideration of distributional effects beyond its traditional scope (Hanna, 2010).

Dealing with uncertainty

Uncertainty pervades fishery management and creates a powerful behavioural incentive that may undermine the rebuilding approach. Uncertainty shortens time horizons and creates incentives on the part of stakeholders to intensify rates of use and avoid investing in the future. Uncertainty is the major reason why implementing long-term rebuilding schedules for overfished stocks is so difficult. It can take the form of fact, tenure or procedural uncertainty. Procedural uncertainty can exist when the managers and stakeholders have incomplete information about legal requirements or when decision making is ambiguous. This kind of uncertainty can undermine co-operation. It can preclude the making of credible commitments or credible threats, where what is promised is reliably delivered. It can also lead to questioning and undermining of authorities and encourage patterns of interference competition (Runge, 1984; Williamson, 1985). When fishery management decisions involve long-term endeavours like stock rebuilding, having established patterns of co-operation can improve the effectiveness of development and implementation (Hanna, 2010).

Fossil fuels and the fishing sector

In June 2009, the Leaders of the G20 nations asked a number of international organisations to provide an assessment of the amount governments expends on fossil fuel subsidies including through the non-taxation of fuel used for certain activities, including fishing. The OECD Committee for Fisheries undertook to collect information on the amount of forgone fuel taxes to the fishing industry. Several OECD and non-OECD economies participated in this exercise. The following provide a brief account of the results and the methodological challenges of addressing fossil fuel tax concessions to the fisheries sector.

Fossil fuels and tax concessions

The OECD's Committee for Fisheries devised a framework of Government Financial Transfers (GFTs), as a detailed classification system in order to collect data on financial transfers from governments to the fishing sector (OECD, 2006). As part of this framework, fuel-tax exemptions fall into one of the seven categories, namely "*Other cost-reducing transfers and direct payments*" which refers to monetary transfers that are intended to reduce the costs of fishers that are not elsewhere captured in the classification system. The OECD notes that "these transfers will have the effect of increasing incomes or reducing variable

costs, and will more directly affect the competitive position of fishers in international trade and maintain their profits in the short term, with the long-term effects dependent on the management regime in place" (OECD, 2006).

A 2010 OECD survey of fossil fuel GFTs for commercial fishing vessels was undertaken in response to the G20 leaders request for "… an analysis of the scope of energy subsidies…". This survey confirms that OECD countries rely on the use of indirect mechanisms, namely various forms of tax relief or concessions. Such fuel-tax concessions are often made available to other primary production sectors of the economy as well, such as agriculture and forestry, though this varies by country.

Where the tax concessions represent a higher proportion of landed value, phasing them out may be more challenging for the fishing industry then where they are lower. Considering transition mechanisms such as the gradual phasing out of fuel-tax concessions may be particularly relevant for countries where their relative importance is high.

Drawing international comparisons of tax concessions based on the data collected for this exercise is a challenge and cannot be undertaken with the information at hand. This is because there is currently no international benchmark (*e.g.* level and extent of fuel-tax) applicable across countries. In certain countries, fuel-tax concessions are also available to numerous other sectors of the economy, such as agriculture and forestry.

The purpose of a fuel-tax can vary according to different economic or policy goals, ranging from raising revenue for various state expenses, or it could be a means of correcting externalities from the production or consumption of the goods or service upon which the tax is levied, such as the effect of greenhouse-gases.

- Some taxes exist to fund specific initiatives and, in these cases, an exemption for fishing vessels may be warranted. For example, a few countries indicated in their response to the OECD survey that since the taxes levied on fuels are earmarked for a specific purpose (*e.g.* a road repair and maintenance fund), a rebate or credit is applied for those that use diesel or other fuels for non-highway uses (such as fishers). The consideration of these circumstances is necessary in the categorisation of the value and impact of such transfers. Identifying whether a fuel-tax concession is an indirect transfer of income to a given sector would be a valuable input to the task of comparing different taxation systems and categorising subsidies and tax concessions.
- Taxes to address externalities (*e.g.* pricing externalities such as CO_2 emissions): Work in this area will be important for estimating the costs and benefits of removing fuel subsidies and tax concessions. While the costs are generally known or relatively straightforward to calculate, quantifying and monetising the benefits of phasing out inefficient fossil fuel subsidies, especially in the interest of reducing greenhouse gas emissions, is more challenging. This benefit-valuation exercise could take advantage of the ongoing work on the social cost of carbon, if the reduction in greenhouse gases from phasing out subsidies in the fisheries sector could be reliably estimated. The G20 statement also hinges on the phrase "inefficient fuel subsidies" which would thus benefit from discussion on what types of transfers should be considered in this context.

Fuel consumption

The 2010 OECD survey also revealed that for the countries that responded, the total amount of fuel consumed by the commercial fishing fleet was 7.7 billion litres in 2008 (this figure also includes fuel consumed that was not eligible for a tax concession). Several

factors explain the variability of fuel consumed per tonne caught such as the distance to fishing grounds, vessel size, the type of gear used (*e.g.* trawling uses more fuel), engine and gear efficiency, type and characteristics of the stock fished.

Impacts of the fishing sector

The impact of fuel tax concessions on the fishing industry is largely dependent on the type of fisheries management regime in place, and in turn, the impacts of removing fuel tax concessions will also depend on the management system. In open-access fisheries, fuel tax concessions will lead to the expansion of effort by individual vessels, increasing both fuel usage and pressure on the resource. Under rights-based regimes (such as ITQs), fuel tax concessions would generally not have any effect on the volume caught, but could distort the choice of production inputs compared with a cost-minimising choice at market prices. The degree to which this effect will produce new outcomes will depend on the extent to which production inputs, or factors of production, are substitutable. While fishers will not have an incentive to fish more under fixed individual quotas, they may elect for example to fish for longer periods of time and with less gear or manpower, effectively substituting fuel for manpower (to a certain extent). If this substitution is not possible, then the impact of tax concessions will be to raise the market price of quotas (OECD, 2006).

Fisheries and aquaculture certification[5]

The rapid internationalisation and integration of food supply chains has raised consumer concerns over the quality of the foods they buy. Demand for consistent and verifiable high quality in food products has sparked a proliferation of signalling and labelling systems aimed at assuring business partners and consumers alike.

A product's quality is determined by its set of intrinsic quality attributes, which include food safety, nutrition, sensory characteristics (*e.g.* taste), value/function, and how the product was produced (*e.g.* sustainability of catch or production practices).

To the buyer, the intrinsic quality attributes of a product can be researched (they can be evaluated prior to purchase), experience (they can be evaluated only after purchase), or credence (they cannot be evaluated even after purchase and use). Standards, certification, and market information are means of communicating the quality of product attributes and then assure buyers.

On the bright side, the development of private certification and quality signalling may be a healthy competition to determine who can best provide and communicate quality assurance and sustainability in the supply chain and to consumers. The process of setting and certifying to standards, along with quality signalling to buyers, can address problems of imperfect information on quality and facilitate markets for quality attributes, particularly for credence attributes. It can use market mechanisms to reward desirable practices through product differentiation and potential price premiums as buyers in the supply chain and consumers can better identify and trust in higher quality products. It can be used by governments, consumer groups, non-governmental organisations and companies to provide incentives for positive developments on both the supply and demand sides of the market.

On the darker side, standards, certification, and quality signalling may work poorly or incompletely in facilitating markets for quality. For example, they may impose requirements on the production chain that do not actually improve quality because they

are not well targeted. They may provide false signals of quality either through poor design or fraud, making it more difficult for buyers to locate products that meet their needs. They may be used strategically by companies, groups of companies, countries, or other parties to disadvantage competing products or to extract payments (*e.g.* through certification fees that are essentially "pay to play" charges).

In principle, more sustainable fisheries can be promoted by well-designed environmental standards based on significant industry participation, credible labelling backed by independent third-party auditing of compliance, strong retail market take-up, and consumer demand for labelled products. It bears consideration, however, from a political economy perspective, whether eco-labelling as a means of improving ecological outcomes is after all a largely inefficient tool when compared to directly targeting fisheries management problems with environmental policy and fishers' incomes with better management and marketing systems.

Government regulators and international bodies face considerable challenges in overseeing and guiding the development of certification and quality signalling systems for fisheries products. A major step in making good decisions is for these parties to delineate which policy goals (*e.g.* improved fisheries management, ecological protection, supply chain functioning, or consumer protection and information) will be pursued through private and public systems of standard setting, certification, and quality signalling.

The special chapter in this *Review* is the Chair's report of the *Round Table on Eco-labelling and Certification in the Fisheries Sector* that OECD and FAO organised with the support of the Dutch Ministry of Agriculture, Nature and Food Quality in April 2009 in The Hague (OECD, 2010b). It provides additional information on the challenges of private certification in fisheries and aquaculture.

Climate change adaptation in the fisheries sector

According to scientific findings climate change is likely to have impacts on the distribution of fish stocks and productivity of fisheries through changes in recruitment, growth rate and mortality rates. However, there is a great deal of uncertainty with respect to what extent the climate change will have impacts on fisheries and how and when the changes will occur. Therefore, fisheries policy makers should develop strategies to adapt to climate change under uncertainty, taking into account social and economic consequences. It is recognised that the fisheries policies should be adaptable and flexible in the face of climate change and the uncertainty involved. In this regard, it is a challenge for fisheries policy makers to address the question of what policy options are available; how should decisions be made; and when should actions be taken.

To address these challenges, the OECD Committee for Fisheries hosted a workshop on "The Economics of Adapting Fisheries to Climate Change" that took place in June 2010 in Busan, Korea. The objectives of the workshop were to increase our understanding on the interaction between climate change and fisheries/aquaculture from economic, social and institutional perspectives, taking into account risks and uncertainties involved; to explore the fisheries policy and management toolbox that will increase flexibility, adaptability and resilience in the face of climate change; and to provide insights to fisheries policy makers on how to respond to climate change and when to make decision under uncertainty.

The Workshop was set in the context of the international agenda and events and initiatives currently being undertaken regarding climate change and the fisheries sector. In

that regard, OECD has a specific role to play with respect to economic and policy analysis and given that there is considerable work being undertaken by the Committee for Fisheries with regard to fisheries science, management policy and governance. However, there is much more to do and many remaining uncertainties in the face of climate change. While the science is relatively advanced in a number of areas, there are significant gaps in knowledge and particularly a need for informed policy-making, strengthened governance structures, and international cooperation based on sound economic analysis.

This section highlights key findings of the workshop and policy implications for fisheries policy makers.

Climate change will affect abundance and distribution of fish stocks but details are not well known, requiring downscaling predictions to the local and stock level

In many locations around the world, changes in fisheries related to phenomena in the ocean are being observed, particularly changes in fish distribution and abundance. Climate change will impact fish species in uncertain ways relative to their preferred/optimal distribution range and some species within an ecosystem may move in one direction, others in another. This will present opportunities for some stakeholders and disadvantage others. In this regard, current management regimes and structures need to be examined. Some changes in species abundance, distribution or ecosystem composition may be irreversible; these shifts will put international arrangements under stress.

There was strong consensus that adoption and implementation of the ecosystem approach is a very important strategy as it is only this approach which can incorporate all elements which are necessary to deal with the complexities of natural systems and the impact of climate change. This, however, is a major task and often ecosystems are not well understood and our ability to manage fisheries stocks on a multi-species basis is not well developed. While there is considerable scientific work being done, the global view on climate change impacts on fisheries is patchy and not fully understood. There is a need for more comprehensive science, particularly with respect to fisheries of developing countries, and a focus on key stocks and areas of concern which will vary geographically in sensitivity to climate change. Aligning global estimates of climate change to the local scale and accordingly downscaling predictions to the local level remains a challenge and must be addressed.

A number of developed nations are actively anticipating, developing and implementing actions to deal with expected climate change impacts on fisheries

The European Union has taken actions to deal with climate change and the actions include the appointment of a European Commissioner for Climate Action, establishment of a Commissioner's Group on Climate Change and an Inter-service Group on Adaptation to Change to explore integration of adaptation policy into policy development. A comprehensive EU adaptation strategy is under development which includes consideration of coastal and marine areas and initiatives are underway to harmonise the approach with EU fisheries management policies and procedures.

In the United Kingdom, the government is developing an approach for climate change adaptation which considers the impact of increased ocean temperature, sea level rise, ocean acidification and changes in storm intensity and ocean circulation with resultant impacts on fish species distribution and abundance. Adaptation approaches are being developed based on securing sustainable biomass, building trust between fishers, scientists and government, and building resilience in marine ecosystems, marine

protective initiatives and incorporation of an ecosystems-based approach to marine management.

In Korea, there have been significant changes in distribution and abundance of major species major impacts of changing ocean conditions, including the appearance of sub-tropical species and toxic jellyfish. In response, Korea has adopted a National Strategy for Green Growth under the vision of "Low Carbon, Green Growth". Within the national framework, Korea has taken climate change into consideration in their fisheries management by establishing the Comprehensive Marine and Fisheries Strategies for Climate Change (2007) and the National Action Plan to Adapt to Climate Change (2009).

Similarly, Chinese Taipei has experienced significant changes in distribution and abundance of fish stocks in recent years with a number of declines in fisheries production and impacts on fishermen and the fishing industry. Typhoon-induced floods have had major impacts on the aquaculture industry through facilities damage and escapes of cultured fish.

Economic effects of climate change will depend on specific conditions of a fishery or coastal community and this should be taken into account in developing adaptation strategies

From an economic point of view, climate change impacts are influenced by a number of factors, including value of catch (*e.g.* productivity, size, species distribution, markets, etc.), costs of production (*e.g.* new investment and energy consumption), employment, community economies (reach of the market for seafood and their flexibility in responding to changes in supply and prices), redistribution of benefits and costs among stakeholders, and long-term profitability and ability to account for a range of possibilities. Economic effects depend on the context of a situation and may be positive or negative. Economic vulnerability of a business or an individual is related to the level of exposure to change, response capability, and level of dependence on the fish species or group of species in question.

Stakeholders and those dependent on fisheries resources are being affected and many will be increasingly affected as climate change impacts intensify, making the need for fisheries adaptation very important; some will benefit and others will lose.

The economic effects of climate change on fisheries and the need for adaptation do not exist in isolation; they are layered upon the existing regimes and systems and the way fisheries are managed and governed. We are thus dealing with coupled aquatic socio-ecological systems where the natural science and biology information is coupled with the way we govern and manage human behaviour.

Fisheries management toolbox that can contribute to climate change adaptation already exists but stronger governance system is needed

The "toolbox" of management practices is quite extensive and includes many techniques such as limited licences and vessel and gear restrictions (input controls), total allowable catch limits, individual transferable quotas and vessels catch limits (output controls), no-take zones, time and area closures, size and sect restrictions (technical measures). Other management tools and approaches include the precautionary approach, limit reference points, by-catch reduction measures as well as local, regional, national and international arrangements, processes, treaties, agreements and instruments.

The consensus of the Workshop is that we have most of the tools in our "toolbox" to effectively manage fisheries and adapt to uncertainty, perhaps also including the impacts of climate change. Our failures however relate to effective governance mechanisms and processes that have led to global stock depletion, particularly in international waters where roughly two-thirds of the stocks are in trouble.

There is a need to avoid "institutional mal-adaptation" where species under quota move between zones and the fishers cannot "follow the fish" to an area where they do not hold quota. An important role for governments is to create efficient markets for trading domestic and international quotas. Other actions for governments include identifying and removing institutional barriers, periodically reviewing protection measures to see if they are still applicable and that they do not dilute incentives for fishers to adapt to climate change and addressing ongoing concerns such as discarding and build trust between fishers, scientists and governments.

"Coping strategies" will need to be developed as aquatic conditions change and the ecosystem responds. In the short term, this may include tuning fishing intensity, gears, times, areas, target species, etc., using the appropriate methods in the fisheries management "toolbox". In the longer term, adapting to climate uncertainty will require political reform leading to effective governance arrangements, and the will and capacity to enforce the required management actions. In this regard, marine spatial planning (or aquatic spatial planning) and integrated ocean management is an important element in developing strategies to respond and adapt fisheries to climate change.

Stakeholders involvement is important and therefore communication with them should be emphasised in developing and implementing adaptation strategies

As a key to making policy changes and building understanding and support for those changes, there is a need to engage the public, the fisheries resource users and a broader set of stakeholders in order to anticipate social and economic impacts, explore options, make the necessary choices and implement new policies. Inclusion of local and traditional knowledge is an important element of this approach. Effective engagement will facilitate the necessary social, economic and political policy changes required to adapt. Failure to do this may cause the often competitive and sometimes antagonistic relationships between competing interests to persist and frustrate effective change and governance.

There is a need to think about how to communicate and implement overarching good governance principles of fisheries management and incorporate climate change impacts while doing that. In this way, the focus would be less on climate change *per se*, but would be considered as part of the complexity and uncertainty to be addressed as part of good fisheries management.

In this context, the growing awareness of the importance of these issues, the shift towards embracing the "Green Growth" paradigm, and the urgency of these matters, offers considerable impetus to move forward, particularly if market forces are harnessed to ensure appropriate reduction in greenhouse gas emissions and more generally in support of green growth and sustainable management practices for aquatic resources. In this context it is important to ensure that the right incentive structures are built.

Developing countries are most vulnerable to climate change and thus developed countries have to help their adaptation capacity building

Developing nations are often those with the higher dependency on fish for food security and the least capacity to change and adapt to climate change impacts. In particular, Some Pacific Island nations, which are very dependent on seafood for food security, may be unable to meet food supply requirements in the future, particularly in the face of climate change. Furthermore, small developing nations with coastal or artisanal fisheries may be significantly impacted by distant water fishing nation activities which may change with climate change influences.

There are accordingly, major global food security issues associated with climate change impacts on the fisheries sector, in particular the freshwater fisheries sector which is very important in some places like Asia and Africa. Considerable research and development efforts are needed in this area to ensure that other human activities and uses (*e.g.* urbanisation, population growth, agriculture) are not negatively effecting water quality, fisheries productivity or aquaculture potential.

For developing nations, there is an urgent need for anticipating and understanding the expected impacts, developing adaptive capacity, particularly for knowledge transfer, capacity building, and effective technology transfer from developed nations. In short, developed countries need to help the developing nations in their adaptive capacity building.

Aquaculture can be a useful tool to respond to climate change and to deal with global food security challenges

Sustainable aquaculture production may be one solution to supplement stagnating/declining capture fisheries or those affected by climate change. Sustainable aquaculture has the potential to help address global food security challenges and may be particularly important for developing countries where fish forms a very important component of the diet. Aquaculture may offer flexibility in dealing with challenges associated with climate change such as water scarcity, storms, temperature, and choice of adaptive species.

Advancing the aquaculture agenda

Aquaculture, the farming of aquatic organisms, has grown markedly in recent decades, with an ever widening production base. In 2007, for the first time, fish from aquaculture supplied more than 50% of aquatic products used for direct food consumption. With growing demand, it is expected to expand further and in many markets aquaculture will increasingly dominate the supply of aquatic foods.

However, prospects and opportunities for growth have been by no means certain, and the industry has at times suffered reverses. Major disease losses have caused catastrophic failures and loss of investment confidence, and there are continuing concerns for environmental impacts. Expectations of profitability linked with technical opportunities have caused some sector segments to expand very rapidly without corresponding market capacity, and falling prices have resulted in business failures and major restructuring. To understand the nature and potential characteristics of the sector's development a range of issues needs to be considered.

As a contribution to this process and with a view to collect further evidence and analysis on aquaculture development the OECD Committee for Fisheries in collaboration with the

French Ministry for Food, Agriculture and Fisheries hosted a Workshop on *Advancing the Aquaculture Agenda: Policies to Ensure a Sustainable Aquaculture Sector*[6] on 15-16 April 2010 in Paris. The main objective of the workshop was to provide a platform for policy makers, technical experts, international organisations, the private sector and NGOs to examine policy challenges that OECD governments face in aquaculture development. The OECD Fisheries Secretariat also carried out a survey on establishing conditions for aquaculture production sites in OECD countries. Main messages drawn from that exercise include:

- the need to simplified regulation and procedures in terms of access to and operation of production sites;
- the added value of stakeholder consultation in developing regulation; and
- the importance of economic incentives for sustainable aquaculture development.

Aquaculture shows parallels to the patterns of intensification in agriculture, for instance in terms of conflicts over access to space and negative environmental externalities. Agricultural productivity has expanded remarkably in a very short time due to massive improvements in production technologies and the "industrialisation" of animal rearing – now also observable in aquaculture production. Seafood availability has increased and consumers have benefited considerably, but the environmental price is high (*e.g.* in terms of pollution; threats to biodiversity; diseases). Better information is vital to understand the interactions between aquaculture and the environment and to tackle negative externalities. While the knowledge base on the challenges in aquaculture has advanced significantly over recent years, communication of that knowledge has been lacking. Meanwhile, policy makers and the aquaculture sector in general are increasingly conscious of the challenges and are taking steps to address these issues, through mitigation activities as well as through more comprehensive sector strategies.

In terms of policy challenges, discussions identified the crucial role of appropriate spatial management (marine, coastal, inland) and of stakeholder participation in aquaculture planning processes. To enable progress, producer compliance with regulations, the sectors' acceptance by third parties and policy coherence are also crucial elements. Aquaculture is in competition with other uses for (access to) water and land resources. It is influenced by the activities of other users and, in turn, can have an impact on them. In this regards, many OECD countries have already implemented zoning policies and established forms of stakeholder consultation platforms but that these instruments need to be adaptive so as to deal with emerging issues (*e.g.* new production techniques like off-shore farming; disease management; social implications of aquaculture). Effective communication between the stakeholders and policy makers is needed for this purpose.

In terms of profitability, the sectors' capacity to attract investment depends among others on the efficiency of the licence/permit allocation system (in terms of timeliness, complexity, duration and renewal) which represents a form of "political" risk for investors that needs to be added to the natural, systemic and the economic risks. The development of improved farming technologies (*e.g.* IMTA, RAS) and the adoption of best practices for disease, escape and environmental impact management are additional instruments to increase the economic performance – and hence investment attractiveness – of the aquaculture industry.

Overall, the aquaculture sector represents an important contributor to the *Green Growth Agenda* but political will needs to be harnessed to further support Green Growth in aquaculture. This calls for the following.[7]

- Risk reduction to encourage sustainable long-term investment in the capital intensive aquaculture sector in OECD countries.
  - ❖ Encourage and recognise the use of better/best practices by producers.
  - ❖ Support adaptive innovation (*e.g.* improved water use, selective breeding, feed formulation).
- Ensure acceptance of sustainable aquaculture by limiting negative externalities on the (marine) environment.
  - ❖ Develop innovative solutions (*e.g.* IMTA).
  - ❖ Optimise management of escapes, disease, pollution and other externalities.
  - ❖ Implement monitoring and early-warning systems.
- Improve the image of the industry.
  - ❖ Develop pro-active information exchange with society and policy-makers.

How to translate lessons learned from best practices into specific policy action?

- Galvanise political will.
  - ❖ Develop clear and realistic national or regional plans for aquaculture development.
  - ❖ Include aquaculture in marine, coastal and inland spatial planning to minimise conflict among user groups.
  - ❖ Develop flexible regulatory frameworks with co-ordination across government agencies and levels of government (*e.g.* agriculture, fish, urbanisation).
  - ❖ Support targeted research and development to promote the following.
    - – Use of green technologies and promotion of sustainable aquaculture species (*e.g.* in terms of feed, nutritional value, GMO).
    - – Market-oriented production benefitting from changing consumption patterns (*e.g.* healthy diet, preference for Omega3-rich food).

Timely and effective dialogue between all stakeholders: how can it be achieved?

- Ensure that stakeholders are involved in developing aquaculture plans and their implementation.
- Consider commercial perspectives to serve public and private interests.
- Conduct information campaigns to make sure sustainable products and production methods are valued by the market and accepted by consumers.

Dealing with emerging issues: How to keep regulatory frameworks flexible?

If the aquaculture sector is to be sustainable, a holistic approach is needed in which profitability, environmental risk and social acceptability are defined and targeted, and where aquaculture is seen as part of a wider picture incorporating not only food supply, but also broader ecosystem services that either contribute to it and/or depend on it.

Notes

1. FAO Fact Sheet, April 2010.
2. Council Regulation (EC) No. 1005/2008 of 29 September 2008.
3. For a description of the ecosystem approach see: "The Ecosystem Approach to Fisheries", *FAO Fisheries Technical Paper*, No. 443, 2003.
4. Library of Congress, Country studies, *US Library of Congress*, *http://countrystudies.us/india/107.htm*.
5. This section draws from Caswell, J.A. and S.M. Anders (2009).
6. Agenda and presentations available at *www.oecd.org/document/3/0,3343,en_2649_33901_44041283_1_1_1_37401,00.html*.
7. This section builds on the Part II of this *Review*.

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ANNEX 1.A1

Statistical Summary Tables to the General Survey, 2011

Table 1.A1.1. **National unit per US dollar (USD)**

	Monetary Unit	2007	2008	2009
Argentina	Argentine Peso	3.10	3.14	3.71
Australia	Australian Dollar	1.20	1.19	1.28
Belgium	Euro	0.73	0.68	0.72
Canada	Canadian Dollar	1.07	1.07	1.14
Chile	Chilean Peso	522.46	522.46	560.86
Chinese Taipei[1]	Taiwanese Dollar	30.10	31.53	33.04
Czech Republic	Czech Koruny	20.29	17.07	19.06
Denmark	Danish Krone	5.44	5.10	5.36
Estonia	Estonian Krooni	11.43	10.69	11.26
Finland	Euro	0.73	0.68	0.72
France	Euro	0.73	0.68	0.72
Germany	Euro	0.73	0.68	0.72
Greece	Euro	0.73	0.68	0.72
Hungary	Forint	183.63	172.11	202.34
Iceland	Icelandic Krona	64.06	87.95	123.64
Ireland	Euro	0.73	0.68	0.72
Italy	Euro	0.73	0.68	0.72
Japan	Yen	117.75	103.36	93.57
Korea	Won	929.26	1 102.04	1 276.93
Mexico	Peso	10.93	11.13	13.51
Netherlands	Euro	0.73	0.68	0.72
New Zealand	New Zealand Dollar	1.36	1.42	1.60
Norway	Norwegian Krone	5.86	5.64	6.29
Poland	Zloty	2.77	2.41	3.12
Portugal	Euro	0.73	0.68	0.72
Russian Federation	Ruble	25.58	24.85	31.74
Slovak Republic	Slovak Koruny (until 2009), then Euro	24.69	21.36	0.72
Spain	Euro	0.73	0.68	0.72
Sweden	Swedish Krona	6.76	6.59	7.65
Thailand	Baht	34.52	33.31	34.29
Turkey	Lira	1.30	1.30	1.55
United Kingdom	Pound	0.50	0.54	0.64
United States	US Dollar	1.00	1.00	1.00

1. *www.x-rates.com*.

Source: OECD.STAT, IMF data, data extracted on 26 May 2010, 07:06 UTC (GMT).

Table 1.A1.2. **Fishing fleet, 2008 and 2009**

	Total vessels				Vessels without engines				Vessels with engines			
	2008		2009		2008		2009		2008		2009	
	Number	GRT/GT	Number	GRT/GT	Number	GRT/GT	Number	GRT/GT	Number	GRT/GT	Number	GRT/GT
Australia	332	48 828	. .	. .	. .	. .	. .	. .	332	48 828	. .	. .
Canada	21 797	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
European Union	54 945	1 043 304	54 610	1 010 678	2 958	2 515	3 032	2 580	53 153	1 187 403	51 871	1 008 240
Belgium	100	19 007	. .	. .	. .	. .	. .	. .	100	19 007	. .	. .
Czech Republic	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Denmark	2 890	73 029	2 833	68 196	74	60	72	58	2 816	72 969	2 761	68 138
Finland	3 242	16 166	3 271	16 374	. .	. .	. .	. .	3 242	16 166	3 271	16 374
France	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Germany	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Greece	17 368	88 897	17 276	88 065	299	146	293	142	17 069	88 751	17 276	88 065
Hungary	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Ireland	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Italy	13 374	182 909	13 609	193 156	1 642	1 674	1 749	1 763	11 732	181 235	11 860	191 393
Netherlands	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Poland	. .	. .	. .	. .	. .	. .	. .		. .	. .	. .	. .
Portugal	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Slovak Republic	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Spain	11 394	458 180	11 116	438 997	943	635	918	617	10 451	457 545	10 198	438 380
Sweden	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
United Kingdom	6 577	205 116	6 505	205 891	. .	. .	. .	. .	6 577	205 116	6 505	205 891
Iceland	1 166	146 614	1 279	144 044	. .	. .	. .	. .	1 166	146 614	1 279	144 044
Japan	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Korea	80 766	621 336	77 713	594 773	2 486	2 239	2 466	2 328	78 280	619 097	75 247	592 445
Mexico	106 205	. .	106 107	. .	102 807	. .	102 807	. .	3 398		3 300	. .
New Zealand	1 435	130 785	. .	. .	. .	. .	. .	. .	1 435	130 785	. .	. .
Norway	6 785	363 239	6 507	369 212	. .	. .	. .	. .	6 788	363 157	6 507	369 212
Turkey	17 816	185 760	. .	. .	82	154	. .	. .	17 734	185 606	. .	. .
United States	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
OECD total	**291 247**	**2 539 867**	**244 937**	**2 118 707**	**108 333**	**4 908**	**108 305**	**4 908**	**2 843 777**	**2 681 491**	**138 204**	**2 113 941**
Argentina	634	193 537	625	189 652	. .	. .	. .	. .	634	193 537	625	189 652
Chile	8 014	188 443	8 320	197 752	380	1 118	400	1 294	7 634	187 325	7 920	196 458
Chinese Taipei	24 889	639 676	24 127	622 899	842	136	768	128	24 047	639 540	23 359	622 771
Estonia	965	17 418	. .	. .	107	65	. .	. .	858	17 353	. .	. .
Russian Federation	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Thailand	12 920	359 038	. .	. .	. .	. .	. .	. .	12 920	359 038	. .	. .
Total	**338 669**	**3 937 979**	**278 009**	**3 129 010**	**109 662**	**6 227**	**109 473**	**6 330**	**2 889 870**	**4 078 284**	**170 108**	**3 122 822**

. .: not available.

Table 1.A1.3. **Employment in fisheries, 2008-09**

	2008				2009			
	Harvest sector	Aquaculture	Processing	Total	Harvest sector	Aquaculture	Processing	Total
Australia	4 606	4 616	. .	9 222	. .	. .	. .	. .
Canada	52 812	4 900	22 020	79 732	. .	. .	. .	. .
European Union	134 734	18 280	24 330	177 344	127 623	10 841	8 650	155 593
Belgium	735	150	*1 350*	2 235	. .	. .	. .	. .
Czech Republic		1 373	133	1 506	. .	. .	. .	1 400
Denmark	2 099	493	4 370	6 962	. .	. .	. .	. .
Finland	2 727	. .	. .	2 727	2 722	. .	. .	2 722
France	. .	. .	. .	. .	. .	. .	. .	. .
Germany	1 932	. .	8 039	9 971	1 508	. .	. .	1 508
Greece	30 634	6 073	2 650	39 357	30 408	5 947	2 780	39 135
Hungary	2 322	1 336	. .	3 658	. .	. .	. .	. .
Ireland	. .	. .	. .	. .	. .	. .	. .	. .
Italy	29 562	. .	. .	29 562	28 967	. .	. .	28 967
Netherlands	2 350	220	4 700	7 270	2 254	220	4 800	7 274
Poland	. .	. .	. .	. .	. .	. .	. .	. .
Portugal	16 854	. .	. .	16 854	17 339	. .	. .	17 339
Slovak Republic	. .	880	1 154	2 034	. .	1 108	1 070	2 178
Spain	30 958	7 376	. .	38 334	30 525	7 079	. .	37 604
Sweden	1 800	379	1 934	4 113	1 688	424	. .	2 112
United Kingdom	12 761	. .	. .	12 761	12 212	3 142	. .	15 354
Iceland	4 200	. .	3 000	7 200	4 300	. .	3 500	7 800
Japan	. .	. .	. .	221 896	. .	. .	. .	. .
Korea	84 010	42 858	. .	126 868	80 123	43 428	. .	123 551
Mexico	243 452	30 332	. .	273 784	242 576	30 690	. .	273 266
New Zealand	1 550	780	5 810	8 140	. .	. .	. .	. .
Norway	12 867	4 868	6 427	24 162	12 730	*4 977*	. .	17 707
Turkey	53 893	7 610	11 464	72 967	. .	. .	. .	. .
United States	. .	. .	37 397	37 397	. .	. .	. .	. .
OECD total	**592 124**	**114 244**	**131 286**	**1 038 712**	**463 052**	**89 936**	**12 150**	**577 917**
Argentina	23 068	. .	. .	23 068	23 477	. .	. .	23 477
Chile	73 081	. .	41 162	114 243	79 072	. .	. .	79 072
Chinese Taipei	257 891	93 569	. .	351 460	. .	. .	. .	. .
Estonia	3 788	96	2 090	5 974	. .	. .	. .	. .
Russian Federation	. .	. .	. .	. .	. .	. .	. .	. .
Thailand	. .	. .	. .	. .	. .	. .	. .	. .
Total	**949 952**	**207 909**	**174 538**	**1 533 457**	**565 601**	**100 777**	**12 150**	**680 466**

In Italics: preliminary data.
. .: not available.
1. Includes harvesting and processing.

Table 1.A1.4. **Government financial transfers to marine capture fisheries sector, 2007**

	Direct payments (A)	Cost reducing transfers (B)	General services (C)	Total transfers (D)	Total landed value (TL)	(A + B)/TL	(A + B + C)/TL
	USD million	USD million	USD million	USD million	USD million	%	%
Australia	. .	. .	58	58	1 162	. .	4.99
Canada	267	13	396	676	1 814	15.41	37.26
European Union	220	96	302	618	10 278	3.07	6.02
Belgium	3	. .	. .	3	124	2.66	2.66
Czech Republic	4	. .	5	9	57	7.39	15.59
Denmark	4	. .	58	62	491	0.81	12.59
Finland	0	2	9	11	29	5.76	37.87
France	*25*	. .	*10*	*35*	1 402	1.82	2.51
Germany	0	0	6	7	302	0.15	2.31
Greece	22	32	3	56	466	11.54	12.08
Hungary	. .	. .	. .	. .	. .	. .	. .
Ireland	*6*	. .	. .	6	1 031	0.60	0.60
Italy	65	. .	58	123	1 807	3.60	6.83
Netherlands	2		4	6	557	0.27	1.01
Poland	*9*	*1*	*11*	*20*	77	12.05	26.52
Portugal	*1*	. .	*30*	*31*	379	0.14	8.15
Slovak Republic	. .	. .	. .	. .	. .	. .	. .
Spain	75	61	59	195	2 245	6.06	8.69
Sweden	5	. .	48	53	160	3.01	33.00
United Kingdom	. .	. .	. .	. .	1 150	. .	. .
Iceland		17	51	68	1 255	4.04	9.44
Japan	13	3	1 805	1 821	9 053	0.18	20.12
Korea	142	22	540	703	4 228	3.87	16.63
Mexico	. .	*85*	. .	*85*	1 083	7.86	7.86
New Zealand	. .	. .	*41*	*41*	. .	. .	. .
Norway	1	49	197	248	2 061	2.44	12.02
Turkey	. .	64	81	145	919	6.94	15.77
United States	145	2	1 838	1 985	4 255	3.47	46.67
OECD total	**788**	**350**	**5 309**	**6 448**	**36 108**	**3.15**	**17.86**
Argentina	. .	. .	*3*	*3*	709	. .	0.44
Chile	1	. .	38	39	1 563	0.09	2.52
Chinese Taipei	36	3	18	57	2 156	1.79	2.63
Estonia	4	. .	5	9	18	44.78	50.13
Russian Federation	. .	. .	. .	. .	. .	. .	. .
Thailand	. .	. .	4	4	*1 603*	. .	0.26
Total	**830**	**353**	**5 378**	**6 561**	**42 156**	**2.81**	**15.56**

The figures for 2007 (previously published) have been revised in accordance with the new methodology. It should be noted that "Marine Capture fisheries – General services" also include general services for Aquaculture and Marketing and Processing, national- and EU-funding.

In italics: Values from data submissions prior to 2009.

. .: not available.

1. Aquaculture.
2. In 2009, the methodology to calculate the Swedish GFT to the fisheries sector was revised (partly due to availability of additional data and a new OECD template).

Table 1.A1.5. **Government financial transfers to marine capture fisheries sector, 2008**

	Direct payments (A)	Cost reducing transfers (B)	General services (C)	Total transfers (D)	Total landed value (TL)	(A + B)/TL	(A + B + C)/TL
	USD million	USD million	USD million	USD million	USD million	%	%
Australia	. .	. .	42	42	1 175	. .	4
Canada	269	11	417	698	1 716	16	41
European Union	137	110	242	488	8 621	3	6
Belgium	1	. .	. .	1	112	1	1
Czech Republic	29	. .	. .	29	67	43	43
Denmark	8	. .	75	83	495	2	17
Finland	0	2	10	12	33	7	37
France	. .	. .	. .	. .	. .	. .	. .
Germany	2	0	4	5	304	1	2
Greece	18	43	6	67	462	13	15
Hungary	. .	. .	. .	. .	. .	. .	. .
Ireland				. .	. .	. .	. .
Italy	13	. .	44	57	1 592	1	4
Netherlands	42	. .	1	43	524	8	8
Poland	. .	. .	. .	. .	. .	. .	. .
Portugal[2]	. .	. .	. .	. .	433	. .	. .
Slovak Republic	. .	. .	. .	. .	. .	. .	. .
Spain	20	34	49	103	2 633	2	4
Sweden	4	. .	52	57	147	3	38
United Kingdom	. .	30	. .	30	1 820	2	2
Iceland	. .	13	35	47	1 127	1	4
Japan	. .	. .	. .	. .	. .	. .	. .
Korea	338	24	430	793	4 128	9	19
Mexico	. .	. .	. .	. .	. .	. .	. .
New Zealand	. .	. .	66	66	212	. .	31
Norway	3	68	201	271	2 156	3	13
Turkey	. .	67	133	200	718	9	28
United States	264	2	1 819	2 084	4 474	6	47
OECD total	**1 010**	**294**	**3 384**	**4 688**	**23 199**	**6**	**20**
Argentina	. .	. .	. .	. .	745	. .	. .
Chile	1	. .	47	48	1 638	0	3
Chinese Taipei	8	3	16	27	1 585	1	2
Estonia[1]	1	. .	3	4	22	4	19
Russian Federation	. .	. .	. .	. .	. .	. .	. .
Thailand[2]	. .	. .	5	5	*1 265*	. .	0
Total	**1 020**	**297**	**3 455**	**4 773**	**28 454**	**5**	**17**

. .: not available.
1. Aquaculture.
2. Landed value for national landings in domestic ports only.
3. Preliminary data for 2008.

Table 1.A1.6. **Government financial transfers to marine capture fisheries sector, 2009**

	Direct payments (A)	Cost reducing transfers (B)	General services (C)	Total transfers (D)	Total landed value (TL)	(A + B)/TL	(A + B + C)/TL
	USD million	USD million	USD million	USD million	USD million	%	%
Australia	. .	. .	. .	. .	. .	. .	. .
Canada	257	4	477	738	1 440	18	51
European Union	141	49	179	369	2 296	6	16
Belgium	. .	. .	9	9	95	. .	10
Czech Republic	37	. .	. .	37	59	62	62
Denmark	2	1	79	82	406	3	20
Finland	2	2	8	12	32	35	39
France	. .	. .	. .	. .	. .	. .	. .
Germany	3	. .	2	5	261	1	2
Greece	25	31	4	61	. .	. .	. .
Hungary	. .	. .	. .	. .	. .	. .	. .
Ireland	. .	. .	. .	. .	. .	. .	. .
Italy	. .	. .	. .	. .	. .	. .	. .
Netherlands	3	. .	. .	3	. .	. .	. .
Poland	. .	. .	. .	. .	. .	. .	. .
Portugal	. .	. .	. .	. .	. .	. .	. .
Slovak Republic	. .	. .	. .	. .	. .	. .	. .
Spain	61	. .	18	79	. .	. .	. .
Sweden	9	. .	58	67	116	13	57
United Kingdom	. .	15	. .	15	1 326	1	1
Iceland	. .	9	22	31	934	1	3
Japan	. .	. .	. .	. .	. .	. .	. .
Korea	85	28	376	489	3 762	3	13
Mexico	. .	. .	. .	. .	. .	. .	. .
New Zealand	. .	. .	. .	. .	. .	. .	. .
Norway	2	65	196	263	1 790	4	15
Turkey	. .	. .	. .	. .	. .	. .	. .
United States					. .	. .	. .
OECD total	**486**	**155**	**1 250**	**1 891**	**8 781**	**7**	**22**
Argentina	. .	. .	. .	. .	624	. .	. .
Chile	1	. .	63	64	1 503	0	4
Chinese Taipei	6	3	15	23	1 605	1	1
Estonia	. .	. .	. .	. .	. .	. .	. .
Russian Federation	. .	. .	. .	. .	. .	. .	. .
Thailand	. .	. .	5	5	*1 246*	. .	0
Total	**493**	**157**	**1 333**	**1 982**	**12 514**	**5**	**16**

In italics: Values from data submissions prior to 2009.
. .: not available.

Table 1.A1.7. **Capture fish production, 2007-09**

	Total volume ('000 tonnes)			Total value (USD million)			Unit value (USD/kg)		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
Australia	182	172	. .	1 158	1 175	. .	6.37	6.82	. .
Canada	1 002	915	936	*1 814*	1 716	1 440	1.81	1.88	1.54
European Union	4 764	3 952	3 690	10 296	8 610	7 788	2.16	2.18	2.11
Belgium	22	20	19	124	112	95	5.68	5.61	4.95
Czech Republic	. .	. .	. .	. .	. .	. .	. .	. .	. .
Denmark	645	682	769	491	495	406	0.76	0.73	0.53
Finland	117	111	116	29	33	32	0.25	0.29	0.27
France	*474*	. .	. .	*1 402*	. .	. .	*2.96*	. .	. .
Germany	262	243	211	302	304	261	1.16	1.25	1.24
Greece	95	87	83	466	446	448	4.92	5.11	5.43
Hungary	. .	. .	. .	. .	. .	. .	. .	. .	. .
Ireland	*219*	. .	. .	*1 031*	. .	. .	*4.71*	. .	. .
Italy	276	227	242	1 844	1 626	1 670	6.69	7.16	6.89
Netherlands	464	401	380	596	573	493	1.28	1.43	1.30
Poland	*133*	. .	. .	77	. .	. .	*0.58*	. .	. .
Portugal	172	179	155	379	432	354	2.21	2.41	2.28
Slovak Republic	. .	. .	. .	. .	. .	. .	. .	. .	. .
Spain	752	802	677	2 243	2 623	2 587	2.98	3.27	3.82
Sweden	246	219	197	160	147	116	0.65	0.67	0.59
United Kingdom	*888*	980	840	*1 150*	1 820	1 326	1.30	1.86	1.58
Iceland	1 419	1 305	1 151	1 254	1 127	934	0.88	0.86	0.81
Japan	4 436	4 400	. .	9 053	. .	. .	2.04	. .	. .
Korea	1 862	1 951	1 839	4 228	4 128	3 762	2.27	2.12	2.05
Mexico	*1 312*	. .	. .	*1 083*	. .	. .	*0.83*	. .	. .
New Zealand	*427*	270	. .	. .	212	. .	. .	0.78	. .
Norway	2 539	2 437	2 529	2 061	2 156	1 790	0.81	0.88	0.71
Turkey	589	443	. .	919	718	. .	1.56	1.62	. .
United States	4 294	3 890	. .	4 255	4 474	. .	0.99	1.15	. .
OECD total	**22 825**	**19 735**	**8 993**	**36 120**	**24 316**	**15 714**	**1.58**	**1.23**	**1.75**
Argentina	965	984	844	709	745	624	0.73	0.76	0.74
Chile	3 687	3 460	3 379	1 563	1 638	1 503	0.42	0.47	0.44
Chinese Taipei	1 174	779	794	2 156	1 585	1 605	1.84	2.03	2.02
Estonia	76	80	. .	18	22	. .	0.24	0.27	. .
Russian Federation	. .	. .	. .	. .	. .	. .	. .	. .	. .
Thailand	2 079	2 224	1 496	1 603	1 802	1 246	0.66	0.81	0.83
Total	**30 808**	**27 263**	**15 507**	**42 168**	**30 108**	**20 692**	**1.37**	**1.10**	**1.33**

Total national landings, including fish, crustaceans, molluscs and algae. In italics: Values from data submissions prior to 2009.
. .: not available.
1. National landings in domestic ports only.
2. Preliminary data for 2009.

Table 1.A1.8. **Aquaculture production, 2007-09**

	Total volume ('000 tonnes)			Total value (USD million)			Unit value (USD/kg)		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
Australia	64	70	. .	725	729	. .	11.32	10.41	. .
Canada	153	144	141	688	681	613	4.51	4.73	4.36
European Union	1 200	818	711	3 716	2 866	1 669	3.10	3.50	2.35
Belgium	0	0	. .	*0*	0	. .	3.15	2.32	. .
Czech Republic	20	20	20	57	67	59	2.83	3.31	2.96
Denmark	42	47	42	153	159	163	3.61	3.41	3.86
Finland	13	13	14	58	62	62	4.49	4.76	4.53
France	*238*	. .	. .	*759*	. .	. .	3.19	. .	. .
Germany	45	44	39	189	136	121	4.24	3.10	3.11
Greece	155	115	118	537	619	545	3.47	5.40	4.62
Hungary	15	15	. .	39	45	. .	2.56	3.01	. .
Ireland	48	. .	. .	*140*	. .	. .	29.10	. .	. .
Italy	247	238	. .	897	893	. .	3.63	3.76	. .
Netherlands	41	36	53	91	96	127	2.20	2.64	2.40
Poland	*36*	. .	. .	*110*	. .	. .	3.06	. .	. .
Portugal	7	8	. .	56	64	. .	7.47	7.96	. .
Slovak Republic	1	1	1	. .	4	2	. .	3.73	2.14
Spain	285	253	268	608	607	551	2.13	2.40	2.05
Sweden	6	9	9	21	34	28	3.51	3.95	2.96
United Kingdom	. .	20	147		81	12		4.00	0.08
Iceland	*5*	5	6	35	28	20	7.21	5.53	3.44
Japan	1 284	1 188	. .	4 110	. .	. .	3.20	. .	. .
Korea	1 386	1 381	1 313	1 721	1 379	1 446	1.24	1.00	1.10
Mexico	*128*	. .	. .	*435*	. .	. .	3.40	. .	. .
New Zealand	42	38	. .	167	186	. .	4.01	4.90	. .
Norway	842	848	960	2 991	3 096	3 502	3.55	3.65	3.65
Turkey	140	152	. .	646	654	. .	4.62	4.30	. .
United States	373	351	. .	843	858	. .	2.26	2.44	. .
OECD total	**5 615**	**4 996**	**3 131**	**16 076**	**10 478**	**7 250**	**2.86**	**2.10**	**2.32**
Argentina	3	3	3	. .	. .	. .	. .	. .	. .
Chile	804	871	758	2 349	2 484	1 748	2.92	2.85	2.31
Chinese Taipei	320	314	282	1 088	963	907	3.40	3.07	3.22
Estonia	1	1	. .	. .	. .	. .	. .	. .	. .
Russian Federation	. .	. .	. .	. .	. .	. .	. .	. .	. .
Thailand	1 370	1 377	1 396	2 137	2 167	2 432	1.56	1.57	1.74
Total	**8 113**	**7 561**	**5 569**	**21 650**	**16 092**	**12 337**	**2.67**	**2.13**	**2.22**

In italics: Values from data submissions prior to 2009.
. .: not available.
1. Data for 2008 corresponds to England and Wales. Data for 2009 corresponds to Scotland.
2. Preliminary data for 2009.

Table 1.A1.9. **Imports of fish for human consumption by major product groups and major world regions, 2008**

USD

	All fish	%	Fish, fresh, frozen, including fillets	%	Fish, dried, smoked	%	Crustaceans and molluscs	%	Prepared and preserved	%
Importers										
European Union	40 667 654 315	53	19 478 890 680	55	2 735 824 097	79	9 691 801 244	46	8 761 138 294	54
Japan	13 535 634 856	18	6 964 931 700	20	257 346 670	7	3 876 361 380	18	2 436 995 107	15
United States	14 740 363 090	19	5 508 965 165	16	245 690 283	7	5 684 506 946	27	3 301 200 696	20
OECD total	**76 503 823 704**	**100**	**35 413 995 153**	**100**	**3 477 468 614**	**100**	**21 265 905 995**	**100**	**16 346 453 942**	**100**
Origins										
OECD	35 158 332 250	46	19 255 876 922	54	2 828 761 734	81	7 138 682 137	34	5 935 011 456	36
Non-OECD	41 345 491 454	54	16 158 118 231	46	648 706 880	19	14 127 223 858	66	10 411 442 485	64
America	9 121 023 462	22	4 135 168 869	26	139 057 616	21	3 236 241 519	23	1 610 555 457	15
Asia	23 085 448 837	56	7 795 472 605	48	280 892 808	43	7 941 952 634	56	7 067 130 790	68
Europe	3 812 099 244	9	2 305 095 467	14	212 695 079	33	1 146 941 270	8	147 367 428	1
Oceania	343 381 325	1	188 031 059	1	312 316	0	19 120 231	0	135 917 719	1
Africa	5 586 920 447	14	2 297 209 663	14	21 522 723	3	1 815 572 439	13	1 452 615 622	14

Fish, fresh, frozen, including fillets = HS codes 302, 303 and 304; Fish, dried, smoked = HS code 305; Crustaceans and molluscs = HS codes 306 and 307; Prepared and preserved = HS codes 1604 and 1605.

. .: not available.

1. EU countries, members of OECD: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden, United Kingdom.
2. The total of the imports from the five non-OECD zones may not correspond to the global figure for non-OECD as a whole, since the latter also includes values from non-specified origin.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.10. **Exports of fish for human consumption by major product groups and major world regions, 2008**

USD

	All fish	%	Fish, fresh, frozen, incl. fillets	%	Fish, dried, smoked	%	Crustaceans and molluscs	%	Prepared and preserved	%
Exporters										
European Union	22 093 859 208	50	11 001 397 819	45	1 756 490 298	49	4 352 163 039	46	4 983 808 053	72
Japan	1 541 007 731	3	757 663 640	3	17 240 672	0	295 420 574	3	470 682 844	7
United States	4 243 742 062	10	2 741 278 401	11	60 948 502	2	954 576 742	10	486 938 417	7
OECD total	**44 597 959 034**	**100**	**24 608 016 524**	**100**	**3 585 274 763**	**100**	**9 481 870 406**	**100**	**6 922 797 341**	**100**
Destination										
OECD	35 271 629 820	79	18 814 445 338	76	2 926 017 711	82	7 503 142 930	79	6 028 023 840	87
Non-OECD	9 326 329 214	21	5 793 571 186	24	659 257 052	18	1 978 727 476	21	894 773 501	13
America	642 442 005	7	161 253 491	3	360 453 982	55	71 028 707	4	49 705 826	6
Asia	4 410 327 401	47	2 326 605 762	40	75 130 736	11	1 462 366 671	74	546 224 232	61
Europe	2 695 346 918	29	2 185 624 436	38	31 848 312	5	295 140 981	15	182 733 189	20
Oceania	72 006 889	1	53 392 166	1	1 428 943	0	8 741 738	0	8 444 042	1
Africa	1 363 368 785	15	982 379 939	17	181 336 190	28	129 390 408	7	70 262 248	8

Fish, fresh, frozen, including fillets = HS codes 302, 303 and 304; Fish, dried, smoked = HS code 305; Crustaceans and molluscs = HS codes 306 and 307; Prepared and preserved = HS codes 1604 and 1605.

. .: not available.

1. EU countries, members of OECD: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden, United Kingdom.
2. The total of the imports from the five non-OECD zones may not correspond to the global figure for non-OECD as a whole, since the latter also includes values from non-specified origin.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.11. **Imports of fish, crustaceans, mollusc and products thereof according to origin,[1] 2008**

Panel A. Importing countries, EU (USD million)

	Australia	Canada	Iceland	Japan	Korea	Mexico	New Zealand	Norway	Switzerland	Turkey	United States	**Total EU**
Origin												
Australia	1	5	0	296	2	0	9	0	2	0	80	**27**
Canada	12	12	11	456	45	9	11	38	10	1	2 289	**606**
Iceland	3	18	0	126	10	1	1	164	6	1	105	**1 474**
Japan	16	20	0	0	171	2	4	2	4	0	277	**50**
Korea	6	9	3	637	0	23	2	1	0	1	102	**124**
Mexico	0	7	0	115	8	0	0	0	0	0	535	**59**
New Zealand	173	10	0	116	16	3	1	1	3	4	151	**140**
Norway	23	32	42	566	53	21	0	0	33	68	182	**4 455**
Switzerland	1	0	0	0	0	9	0	0	0	0	1	**9**
Turkey	0	1	0	82	13	0	0	5	1	0	7	**297**
United States	33	722	2	1 513	129	96	6	91	16	9	0	**1 272**
European Union	45	41	7	479	71	13	2	415	393	12	314	**16 698**
Austria	0	0	0	0	0	0	0	0	2	0	0	**11**
Belgium	0	0	0	0	0	0	0	1	5	0	1	**602**
Czech Republic	0	0	0	0	0	0	0	0	0	0	0	**22**
Denmark	20	2	3	62	7	1	0	243	81	0	7	**2 435**
Finland	0	0	0	2	0	0	0	0	0	0	0	**25**
France	1	3	2	35	11	2	0	7	64	5	18	**1 530**
Germany	3	1	0	24	1	0	0	26	78	0	10	**1 852**
Greece	1	3	0	17	3	0	0	1	3	0	18	**482**
Hungary	0	0	0	0	0	0	0	0	0	0	0	**9**
Ireland	1	2	0	5	10	0	0	16	3	0	6	**398**
Italy	5	5	0	65	9	0	0	0	32	1	9	**555**
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	**14**
Netherlands	2	3	1	44	1	0	0	5	69	0	46	**2 388**
Poland	4	2	0	9	0	0	0	9	17	0	23	**896**
Portugal	2	6	0	18	1	1	0	0	8	0	11	**600**
Slovak Republic	0	0	0	0	0	0	0	0	0	0	0	**13**
Spain	2	5	0	182	5	10	0	2	16	2	44	**2 476**
Sweden	1	0	0	2	0	0	0	63	2	0	2	**852**
United Kingdom	4	8	0	14	21	0	0	41	13	2	119	**1 538**
Non-OECD America	60	253	6	1 494	165	145	7	279	7	45	2 867	**5 071**
Non-OECD Asia	678	834	7	6 080	1 490	263	79	89	141	23	7 460	**6 214**
Non-OECD Oceania	10	4	0	143	2	2	3	0	0	0	117	**70**
Africa	65	10	6	506	42	1	0	28	18	22	153	**4 869**
World	1 100	2 024	110	14 116	2 651	588	125	1 289	645	182	14 967	**42 194**

1. Comprises codes SH 0302-0307, 121220, 1504, 1604, 1605 and 230120.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.11. **Imports of fish, crustaceans, mollusc and products thereof according to origin,[1] 2008** *(cont.)*

Panel B. Importing countries, OECD (USD million)

	Austria	Belgium	Czech Republic	Denmark	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Luxemburg	Netherlands	Poland	Portugal	Slovak Republic	Spain	Sweden	United Kingdom	**Total OECD**
Origin																				
Australia	0	0	0	0	0	13	2	2	0	0	2	0	1	0	0	0	3	0	4	**422**
Canada	1	42	1	160	5	94	52	3	0	1	22	0	16	2	23	0	40	20	124	**3 501**
Iceland	1	74	3	103	8	101	90	16	0	2	0	0	175	38	40	0	184	14	622	**1 908**
Japan	0	2	0	1	0	20	5	1	0	0	1	0	12	0	0	0	3	0	4	**548**
Korea	0	12	0	0	0	12	4	1	0	0	30	0	2	1	4	0	54	1	2	**907**
Mexico	0	0	0	0	0	5	0	5	0	0	15	0	0	0	0	0	32	0	0	**724**
New Zealand	1	5	0	10	0	21	11	8	0	0	7	0	3	3	3	0	52	5	9	**618**
Norway	14	1	11	358	135	588	314	32	0	3	1	0	112	360	57	2	126	2 116	225	**5 476**
Switzerland	0	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0	1	0	1	**20**
Turkey	1	6	4	5	0	28	22	53	1	0	57	0	61	5	1	0	48	3	2	**406**
United States	1	27	7	100	2	245	277	6	0	1	69	0	68	42	110	1	128	12	176	**3 889**
European Union	340	1 204	108	584	115	2 243	1 714	395	67	216	3 004	99	999	397	1 278	42	2 217	403	1 272	**18 490**
Austria	0	0	1	1	0	0	4	1	2	0	2	0	0	0	0	0	0	0	0	**13**
Belgium	3	0	1	9	0	148	46	10	1	3	29	37	189	1	7	0	81	3	36	**609**
Czech Republic	2	0	0	1	0	2	2	0	2	0	0	0	0	1	0	11	2	0	0	**22**
Denmark	33	101	13	0	43	250	446	60	5	6	399	4	167	103	54	1	212	251	285	**2 862**
Finland	0	0	0	5	0	1	1	0	0	0	0	0	0	1	0	0	0	17	0	**27**
France	15	216	6	30	3	31	89	19	3	12	381	28	51	13	42	1	442	24	123	**1 678**
Germany	184	136	22	160	14	193	0	61	17	20	224	7	352	85	21	5	55	31	265	**1 997**
Greece	3	3	4	1	0	81	18	0	0	1	199	1	8	1	29	0	101	0	33	**527**
Hungary	0	0	0	0	0	5	0	1	0	0	0	0	0	1	0	0	0	0	1	**9**
Ireland	1	8	3	14	0	117	21	1	0	6	23	0	26	9	3	0	79	5	82	**441**
Italy	25	15	7	16	1	70	51	73	3	0	0	1	19	3	11	1	240	1	19	**682**
Luxembourg	0	7	0	0	0	3	1	0	0	0	1	0	0	0	0	0	0	0	1	**14**
Netherlands	51	545	6	76	4	284	358	50	9	6	401	12	0	43	121	1	231	37	155	**2 560**
Poland	7	16	32	45	2	95	523	2	14	2	32	0	10	0	0	7	4	17	89	**962**
Portugal	7	5	0	7	0	91	5	4	0	1	72	5	4	0	0	0	349	1	49	**646**
Slovak Republic	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0	8	0	0	0	**13**
Spain	5	26	9	15	3	371	65	79	5	1	976	1	19	25	812	5	0	3	54	**2 744**
Sweden	1	42	1	144	43	38	24	24	1	0	119	0	17	94	159	1	64	0	80	**923**
United Kingdom	3	82	1	61	1	465	61	10	1	158	147	4	136	18	20	1	358	13	1	**1 760**
Non-OECD America	10	160	7	624	7	725	516	25	3	1	657	0	86	46	52	3	1 907	9	233	**10 398**
Non-OECD Asia	52	550	63	175	41	757	1 023	83	6	5	692	1	502	291	108	16	807	128	914	**23 356**
Non-OECD Oceania	0	1	0	0	0	9	26	0	0	0	18	0	4	0	0	0	6	1	5	**349**
Africa	4	132	4	8	2	817	191	111	0	1	828	0	258	15	163	1	1 950	8	375	**5 721**
World	433	2 238	220	2 316	337	5 859	4 414	781	81	235	5 402	101	2 337	1 261	1 881	76	7 259	2 732	4 232	**79 990**

1. Comprises codes SH 0302-0307, 121220, 1504, 1604, 1605 and 230120.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.12. **Exports of fish, crustaceans, mollusc and products thereof according to destination,[1] 2008**

Panel A. Exporting countries, EU (USD million)

	Australia	Canada	Iceland	Japan	Korea	Mexico	New Zealand	Norway	Switzerland	Turkey	United States	**Total EU**
Destination												
Australia	0	10	3	12	5	0	182	20	0	0	52	**46**
Canada	3	0	12	16	5	0	9	17	0	1	915	**39**
Iceland	0	9	0	0	1	0	0	34	0	0	1	**10**
Japan	247	278	74	0	598	79	82	425	0	112	791	**366**
Korea	1	35	8	167	0	6	21	47	0	7	275	**49**
Mexico	0	0	0	0	12	0	2	21	1	0	84	**13**
New Zealand	8	6	2	21	60	0	0	1	0	0	9	**2**
Norway	0	8	153	1	2	0	0	0	0	3	31	**441**
Switzerland	1	3	7	3	0	0	1	35	0	1	7	**426**
Turkey	0	1	0	0	1	0	2	62	0	0	11	**16**
United States	60	2 325	108	251	94	579	132	179	2	6	0	**296**
European Union	26	444	1 354	26	87	46	130	4 247	13	282	1 137	**18 641**
Austria	0	0	0	0	0	0	0	6	0	1	0	**354**
Belgium	1	28	65	3	2	0	5	61	0	13	27	**1 058**
Czech Republic	0	0	0	0	0	0	0	9	0	3	0	**130**
Denmark	1	84	91	1	0	0	2	532	0	3	72	**528**
Finland	0	4	8	1	0	0	0	138	0	0	1	**155**
France	11	67	90	5	8	7	18	779	1	21	178	**3 049**
Germany	2	54	93	3	1	0	18	251	4	29	243	**2 411**
Greece	3	3	27	1	1	2	7	57	0	48	8	**369**
Hungary	0	0	0	0	0	0	0	0	0	0	0	**69**
Ireland	0	2	11	0	0	0	0	4	0	0	3	**269**
Italy	1	17	28	0	25	5	7	256	2	50	80	**3 063**
Luxembourg	0	0	0	0	0	0	0	3	0	0	0	**100**
Netherlands	1	28	124	8	2	1	4	269	0	66	186	**1 246**
Poland	0	2	33	0	0	0	1	468	0	0	17	**631**
Portugal	0	18	96	0	4	0	4	392	0	1	68	**1 196**
Slovak Republic	0	0	0	0	0	0	0	0	0	0	0	**55**
Spain	3	28	181	2	40	29	48	274	0	39	126	**2 056**
Sweden	0	17	15	0	0	0	5	328	3	3	10	**424**
United Kingdom	4	92	493	1	2	1	12	419	1	4	119	**1 478**
Non-OECD America	0	55	7	14	13	27	1	278	0	0	112	**169**
Non-OECD Asia	539	398	40	937	388	89	328	478	5	4	810	**612**
Non-OECD Oceania	3	2	0	32	3	0	12	1	0	0	13	**8**
Africa	1	3	63	77	25	0	35	234	1	1	36	**908**
World	895	3 718	1 992	1 584	1 314	827	968	7 373	24	437	4 440	**23 140**

1. Comprises codes SH 0302-0307, 121220, 1504, 1604, 1605 and 230120.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.12. **Exports of fish, crustaceans, mollusc and products thereof according to destination,[1] 2008** *(cont.)*

Panel B. Exporting countries, OECD (USD million)

	Austria	Belgium	Czech Republic	Denmark	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Luxemburg	Netherlands	Poland	Portugal	Slovak Republic	Spain	Sweden	United Kingdom	**Total OECD**
Destination																				
Australia	0	0	0	21	0	1	2	1	0	2	5	0	2	4	2	0	2	1	4	**329**
Canada	0	0	0	2	0	2	1	3	0	0	4	0	3	2	8	0	2	0	11	**1 017**
Iceland	0	0	0	6	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	**56**
Japan	0	0	0	70	2	32	17	15	0	8	21	0	38	6	3	0	144	1	8	**3 050**
Korea	0	0	0	10	0	2	1	0	0	9	0	0	2	0	0	0	4	0	22	**615**
Mexico	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	10	0	0	**134**
New Zealand	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**109**
Norway	0	1	0	274	1	10	68	0	0	0	0	0	9	7	0	0	0	58	11	**639**
Switzerland	1	2	0	82	0	53	72	2	0	1	28	0	142	17	7	0	14	3	2	**486**
Turkey	0	0	0	1	0	7	1	3	0	0	0	0	1	0	0	0	2	0	0	**92**
United States	0	1	0	13	0	21	8	13	0	2	8	0	50	23	15	0	32	4	105	**4 031**
European Union	18	1 216	40	2 671	21	1 510	2 029	565	2	376	517	16	2 228	1 036	577	9	2 556	1 733	1 521	**26 432**
Austria	0	6	3	43	0	15	204	2	0	1	26	0	31	2	7	0	3	7	6	**362**
Belgium	0	0	1	80	0	208	126	3	0	7	13	6	488	17	4	0	22	31	53	**1 264**
Czech Republic	1	1	0	16	0	6	29	4	0	1	9	0	5	35	0	5	7	8	2	**143**
Denmark	0	14	0	0	3	27	143	1	0	11	1	0	36	48	1	0	13	155	75	**1 313**
Finland	0	1	0	50	0	2	11	0	0	0	0	0	7	2	0	0	4	75	2	**307**
France	0	422	2	292	0	0	359	82	1	108	66	5	343	95	85	0	419	339	429	**4 234**
Germany	9	104	2	653	1	131	0	27	0	29	73	2	429	601	5	0	87	115	142	**3 108**
Greece	0	9	0	66	0	19	44	0	0	2	74	0	23	1	3	0	93	26	10	**524**
Hungary	3	1	4	6	0	5	15	0	0	0	5	0	3	18	0	3	6	1	0	**70**
Ireland	0	2	1	8	0	19	17	3	0	0	1	0	9	4	1	0	3	1	202	**289**
Italy	4	39	0	389	0	443	164	254	0	22	0	1	394	38	65	0	1 002	94	154	**3 536**
Luxembourg	0	37	0	3	0	28	7	1	0	0	0	0	13	0	5	0	1	1	3	**103**
Netherlands	0	351	0	225	0	52	366	20	0	16	13	0	0	24	4	0	23	53	98	**1 936**
Poland	1	3	1	98	0	9	102	1	0	8	2	0	43	0	0	0	13	334	17	**1 152**
Portugal	0	8	0	14	0	29	26	29	0	4	2	0	37	1	0	0	789	230	28	**1 780**
Slovak Republic	1	0	27	3	0	0	6	0	0	1	0	0	3	7	0	0	4	1	1	**55**
Spain	0	99	0	156	0	379	87	95	0	69	215	0	181	6	352	0	0	133	284	**2 826**
Sweden	0	7	0	265	16	8	27	1	0	5	1	0	47	27	1	0	4	0	16	**805**
United Kingdom	0	111	0	303	0	130	294	43	0	92	16	0	138	113	44	0	64	130	0	**2 625**
Non-OECD America	0	2	0	14	0	3	2	0	0	1	1	0	5	1	50	0	85	0	4	**678**
Non-OECD Asia	0	1	0	209	0	31	16	1	0	8	6	0	105	20	4	0	143	1	66	**4 628**
Non-OECD Oceania	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	**73**
Africa	0	13	0	16	0	201	6	1	0	53	19	0	257	2	41	0	282	1	17	**1 386**
World	23	1 245	44	3 645	45	1 924	2 280	647	3	489	742	16	2 907	1 162	714	9	3 462	1 882	1 901	**46 712**

1. Comprises codes SH 0302-0307, 121220, 1504, 1604, 1605 and 230120.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.13. **Imports of fish for human consumption by major product groups and major world regions, 2009**

USD

	All fish	%	Fish, fresh, frozen, incl. fillets	%	Fish, dried, smoked	%	Crustaceans and molluscs	%	Prepared and preserved	%
Importers										
EU	26 592 644 586	60	12 916 890 976	65	1 983 649 748	83	5 366 378 764	47	6 325 725 098	59
Japan	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
United States	13 669 664 860	31	5 335 227 162	27	249 895 110	10	4 986 695 444	44	3 097 847 144	29
OECD total	**44 432 418 248**	**100**	**19 930 189 584**	**100**	**2 384 763 745**	**100**	**11 383 101 955**	**100**	**10 734 362 964**	**100**
Origins										
OECD	23 067 740 306	52	12 027 650 346	60	1 983 404 151	83	4 565 141 635	40	4 491 544 175	42
Non-OECD	21 364 677 942	48	7 902 539 238	40	401 359 594	17	6 817 960 320	60	6 242 818 789	58
America	4 634 452 299	22	2 042 029 922	26	50 618 547	13	1 726 672 672	25	815 131 158	13
Asia	12 810 794 902	60	4 312 652 160	55	189 590 290	47	4 223 958 816	62	4 084 593 636	65
Europe	1 517 893 902	7	915 617 010	12	149 314 532	37	340 018 163	5	112 944 197	2
Oceania	200 598 789	1	44 256 188	1	291 268	0	10 539 066	0	145 512 268	2
Africa	2 442 702 302	11	768 580 090	10	15 294 363	4	556 072 492	8	1 102 755 358	18

Fish, fresh, frozen, including fillets = HS codes 302, 303 and 304; Fish, dried, smoked = HS code 305; Crustaceans and molluscs = HS codes 306 and 307; Prepared and preserved = HS codes 1604 and 1605.

. .: not available.

1. EU countries members of OECD: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden, United Kingdom.
2. The total of the imports from the five non-OECD zones may not correspond to the global figure for non-OECD as a whole, since the latter also includes values from non-specified origin.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.14. **Exports of fish for human consumption by major product groups and major world regions, 2009**

USD

	All fish	%	Fish, fresh, frozen, including fillets	%	Fish, dried, smoked	%	Crustaceans and molluscs	%	Prepared and preserved	%
Exporters										
EU	12 665 021 226	44	6 510 300 950	39	1 035 724 993	50	2 339 035 834	40	2 779 959 448	72
Japan	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
United States	3 965 463 093	14	2 466 363 924	15	56 476 388	3	962 541 309	16	480 081 472	13
OECD total	**28 677 125 601**	**100**	**16 868 197 606**	**100**	**2 071 967 987**	**100**	**5 898 052 347**	**100**	**3 838 907 661**	**100**
Destination										
OECD	22 775 451 410	79	13 186 699 814	78	1 581 950 973	76	4 508 473 582	76	3 498 327 041	91
Non-OECD	5 901 674 191	21	3 681 497 792	22	490 017 014	24	1 389 578 766	24	340 580 620	9
America	453 327 224	8	66 269 747	2	307 378 013	63	43 915 324	3	35 764 141	11
Asia	2 811 837 889	48	1 496 808 815	41	47 194 828	10	1 129 630 220	81	138 204 026	41
Europe	1 922 090 781	33	1 636 427 256	44	25 725 962	5	159 299 751	11	100 637 812	30
Oceania	27 059 392		13 287 714		1 179 401	0	7 669 075	1	4 923 203	1
Africa	551 064 085	9	381 375 782	10	99 383 374	20	36 635 159	3	33 669 771	10

Fish, fresh, frozen, including fillets = HS codes 302, 303 and 304; Fish, dried, smoked = HS code 305; Crustaceans and molluscs = HS codes 306 and 307; Prepared and preserved = HS codes 1604 and 1605.

. .: not available.

1. EU countries members of OECD: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovakia, Spain, Sweden, United Kingdom.
2. The total of the exports from the five non-OECD zones may not correspond to the global figure for non-OECD as a whole, since the latter also includes values from non-specified origin.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.15. **Imports of fish, crustaceans, mollusc and products thereof according to origin,[1] 2009**

Panel A. Importing countries, EU (USD million)

	Australia	Canada	Iceland	Japan	Korea	Mexico	New Zealand	Norway	Switzerland	Turkey	United States	**Total EU**
Origin												
Australia	2	5	0	0	0	0	8	1	2	0	53	**18**
Canada	13	22	0	0	0	0	6	34	9	0	2 041	**407**
Iceland	2	14	0	0	0	0	0	164	5	4	93	**875**
Japan	17	19	0	0	0	0	3	2	3	0	269	**24**
Korea	7	10	0	0	0	0	1	1	0	1	107	**55**
Mexico	0	22	0	0	0	0	0	0	0	3	509	**30**
New Zealand	167	11	0	0	0	0	3	0	2	0	119	**75**
Norway	21	36	0	0	0	0	0	0	33	69	371	**3 923**
Switzerland	0	0	0	0	0	0	0	0	0	0	5	**6**
Turkey	0	2	0	0	0	0	0	8	2	0	15	**126**
United States	38	678	0	0	0	0	6	40	14	4	0	**764**
European Union	42	45	0	0	0	0	2	411	378	20	395	**11 616**
Austria	0	0	0	0	0	0	0	0	2	0	0	**7**
Belgium	0	0	0	0	0	0	0	2	6	0	1	**318**
Czech Republic	0	0	0	0	0	0	0	0	0	0	0	**7**
Denmark	17	9	0	0	0	0	0	200	70	0	15	**1 638**
Finland	0	0	0	0	0	0	0	0	0	0	0	**20**
France	1	3	0	0	0	0	0	6	61	11	25	**914**
Germany	3	2	0	0	0	0	0	23	79	1	8	**1 154**
Greece	1	3	0	0	0	0	0	0	3	1	20	**360**
Hungary	0	0	0	0	0	0	0	0	0	0	0	**7**
Ireland	2	2	0	0	0	0	0	15	3	0	5	**307**
Italy	5	4	0	0	0	0	0	1	31	0	8	**167**
Luxembourg	0	0	0	0	0	0	0	0	0	0	0	**12**
Netherlands	1	1	0	0	0	0	0	3	70	0	41	**1 898**
Poland	4	3	0	0	0	0	0	10	15	0	40	**894**
Portugal	2	5	0	0	0	0	0	1	7	0	10	**203**
Slovak Republic	0	0	0	0	0	0	0	0	0	0	0	**2**
Spain	2	5	0	0	0	0	0	2	16	4	43	**2 162**
Sweden	1	1	0	0	0	0	0	56	3	0	2	**555**
United Kingdom	3	7	0	0	0	0	0	92	11	2	176	**992**
Non-OECD America	52	221	0	0	0	0	9	297	5	50	2 433	**2 563**
Non-OECD Asia	660	862	0	0	0	0	63	72	140	16	6 823	**4 302**
Non-OECD Oceania	11	5	0	0	0	0	2	0	0	0	122	**68**
Africa	59	7	0	0	0	0	0	18	18	8	135	**2 249**
World	1 069	1 997	0	0	0	0	106	1 168	620	177	13 868	**27 867**

1. Comprises codes SH 0302-0307, 121220, 1504, 1604, 1605 and 230120.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.15. **Imports of fish, crustaceans, mollusc and products thereof according to origin,[1] 2009** *(cont.)*

Panel B. Importing countries, OECD (USD million)

	Austria	Belgium	Czech Republic	Denmark	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Luxemburg	Netherlands	Poland	Portugal	Slovak Republic	Spain	Sweden	United Kingdom	**Total OECD**
Origin																				
Australia	0	0	0	0	0	8	2	0	0	0	4	0	0	0	0	0	0	0	4	**88**
Canada	1	37	0	106	4	72	36	0	0	1	15	0	0	0	7	0	0	16	111	**2 533**
Iceland	1	83	3	42	7	101	83	0	0	9	0	0	0	0	22	0	0	11	512	**1 157**
Japan	1	1	0	1	0	14	2	0	0	0	2	0	0	0	0	0	0	0	2	**338**
Korea	0	4	0	0	0	14	4	0	0	0	26	0	0	0	2	0	0	0	5	**182**
Mexico	0	0	0	0	0	10	1	0	0	0	12	0	0	0	7	0	0	0	0	**564**
New Zealand	2	4	0	8	0	20	15	0	0	1	9	0	0	0	3	0	0	3	10	**377**
Norway	15	1	10	360	148	629	484	0	0	5	1	0	0	0	23	0	0	2 070	176	**4 453**
Switzerland	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	1	**12**
Turkey	2	3	2	2	0	21	29	0	0	0	58	0	0	0	1	0	0	2	7	**153**
United States	2	31	6	54	1	221	221	0	0	1	67	0	0	0	29	0	0	11	119	**1 545**
European Union	308	1 088	99	472	114	2 202	1 679	0	0	179	2 833	94	0	0	1 130	0	0	346	1 071	**12 907**
Austria	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	3	**10**
Belgium	2	0	1	10	0	148	52	0	0	2	34	35	0	0	10	0	0	3	21	**328**
Czech Republic	2	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	**7**
Denmark	29	86	12	0	42	214	402	0	0	6	361	2	0	0	27	0	0	211	246	**1 950**
Finland	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	17	0	**20**
France	15	205	5	29	3	44	83	0	0	10	344	27	0	0	28	0	0	22	98	**1 022**
Germany	162	119	22	149	11	170	0	0	0	18	239	8	0	0	28	0	0	28	201	**1 271**
Greece	4	2	1	1	0	78	20	0	0	0	202	1	0	0	27	0	0	0	24	**388**
Hungary	0	0	1	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	**7**
Ireland	1	8	4	16	0	131	26	0	0	2	32	0	0	0	3	0	0	6	78	**334**
Italy	24	13	4	14	1	45	43	0	0	0	0	1	0	0	11	0	0	0	11	**216**
Luxembourg	0	6	0	0	0	3	1	0	0	0	1	0	0	0	0	0	0	1	0	**12**
Netherlands	44	499	5	57	4	250	357	0	0	8	374	11	0	0	125	0	0	30	133	**2 014**
Poland	9	16	32	41	4	115	543	0	0	4	35	0	0	0	1	0	0	14	80	**966**
Portugal	6	5	0	2	0	84	3	0	0	0	60	5	0	0	0	0	0	1	38	**228**
Slovak Republic	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
Spain	5	20	9	12	3	373	52	0	0	1	923	1	0	0	726	0	0	2	36	**2 234**
Sweden	2	40	1	80	44	36	36	0	0	1	93	0	0	0	121	0	0	0	101	**617**
United Kingdom	3	67	1	59	1	504	58	0	0	127	133	4	0	0	24	0	0	11	0	**1 283**
Non-OECD America	14	120	7	496	4	655	496	0	0	2	535	0	0	0	37	0	0	6	191	**5 631**
Non-OECD Asia	49	403	60	162	34	735	1 112	0	0	8	642	2	0	0	144	0	0	119	830	**12 938**
Non-OECD Oceania	1	1	0	1	0	14	25	0	0	0	19	0	0	0	0	0	0	1	7	**208**
Africa	8	113	4	9	3	693	153	0	0	5	766	0	0	0	166	0	0	17	314	**2 495**
World	411	1 914	202	1 867	338	5 566	4 519	0	0	213	4 983	97	0	0	1 579	0	0	2 610	3 568	**46 871**

1. Comprises codes SH 0302-0307, 121220, 1504, 1604, 1605 and 230120.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.16. **Exports of fish, crustaceans, mollusc and products thereof according to destination,[1] 2009 (value)**

Panel A. Exporting countries, EU (USD million)

	Australia	Canada	Iceland	Japan	Korea	Mexico	New Zealand	Norway	Switzerland	Turkey	United States	**Total EU**
Destination												
Australia	0	8	0	0	0	0	174	17	0	0	40	**34**
Canada	3	0	0	0	0	0	8	30	0	2	887	**35**
Iceland	0	16	0	0	0	0	0	15	0	0	1	**17**
Japan	192	232	0	0	0	0	86	328	0	66	750	**97**
Korea	1	31	0	0	0	0	22	61	0	4	263	**33**
Mexico	0	0	0	0	0	0	1	10	1	0	60	**2**
New Zealand	13	2	0	0	0	0	0	1	0	0	7	**1**
Norway	0	12	0	0	0	0	0	0	0	0	23	**436**
Switzerland	1	3	0	0	0	0	1	32	0	1	9	**245**
Turkey	0	0	0	0	0	0	0	62	0	0	5	**15**
United States	47	2 068	0	0	0	0	103	286	4	6	0	**239**
European Union	20	359	0	0	0	0	121	3 980	9	231	943	**11 131**
Austria	0	0	0	0	0	0	0	7	0	1	0	**294**
Belgium	0	25	0	0	0	0	4	54	0	2	29	**508**
Czech Republic	0	0	0	0	0	0	0	7	0	1	0	**64**
Denmark	1	54	0	0	0	0	3	502	0	2	39	**352**
Finland	0	3	0	0	0	0	0	139	0	0	1	**145**
France	6	55	0	0	0	0	18	752	1	14	164	**2 074**
Germany	2	32	0	0	0	0	18	293	2	33	193	**1 186**
Greece	0	3	0	0	0	0	11	36	0	33	8	**246**
Hungary	0	0	0	0	0	0	0	1	0	0	0	**33**
Ireland	0	0	0	0	0	0	1	10	0	0	2	**208**
Italy	3	13	0	0	0	0	8	216	2	49	83	**1 251**
Luxembourg	0	0	0	0	0	0	0	2	0	0	0	**81**
Netherlands	1	29	0	0	0	0	3	271	0	56	143	**1 022**
Poland	0	1	0	0	0	0	0	494	0	3	16	**640**
Portugal	0	7	0	0	0	0	5	256	0	0	24	**348**
Slovak Republic	0	0	0	0	0	0	0	0	0	0	0	**40**
Spain	3	18	0	0	0	0	39	249	0	22	127	**1 448**
Sweden	0	18	0	0	0	0	2	320	1	2	11	**299**
United Kingdom	2	100	0	0	0	0	10	371	1	12	104	**895**
Non-OECD America	0	51	0	0	0	0	1	232	0	0	108	**71**
Non-OECD Asia	499	356	0	0	0	0	313	528	6	5	879	**339**
Non-OECD Oceania	1	1	0	0	0	0	11	1	0	0	9	**4**
Africa	1	4	0	0	0	0	31	218	0	0	37	**280**
World	781	3 246	0	0	0	0	893	7 004	21	345	4 120	**13 650**

1. Comprises codes SH 0302-0307, 121220, 1504, 1604, 1605 and 230120.

Source: OECD (2009), *International Trade Statistics Database*.

Table 1.A1.16. **Exports of fish, crustaceans, mollusc and products thereof according to destination,[1] 2009 (value)** *(cont.)*

Panel B. Exporting countries, OECD (USD million)

	Austria	Belgium	Czech Republic	Denmark	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Luxemburg	Netherlands	Poland	Portugal	Slovak Republic	Spain	Sweden	United Kingdom	**Total OECD**
Destination																				
Australia	0	0	0	19	0	1	3	0	0	1	4	0	0	0	1	0	0	1	3	**272**
Canada	0	0	0	10	0	3	1	0	0	0	4	0	0	0	7	0	0	1	9	**965**
Iceland	0	0	0	5	0	0	11	0	0	0	0	0	0	0	1	0	0	0	1	**50**
Japan	0	0	0	52	1	12	5	0	0	5	9	0	0	0	5	0	0	0	8	**1 752**
Korea	0	0	0	8	0	1	0	0	0	6	0	0	0	0	0	0	0	0	17	**417**
Mexico	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**74**
New Zealand	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**24**
Norway	0	1	0	249	0	5	117	0	0	0	0	0	0	0	0	0	0	57	7	**472**
Switzerland	2	5	0	72	0	54	69	0	0	2	26	0	0	0	6	0	0	2	8	**292**
Turkey	0	0	0	3	0	6	4	0	0	0	0	0	0	0	0	0	0	0	0	**82**
United States	0	0	0	21	0	18	8	0	0	1	8	0	0	0	16	0	0	4	163	**2 753**
European Union	20	1 039	46	2 274	21	1 236	1 934	0	0	338	467	16	0	0	485	0	0	1 847	1 408	**16 794**
Austria	0	4	3	38	0	15	188	0	0	1	26	0	0	0	6	0	0	7	6	**303**
Belgium	0	0	1	70	0	192	124	0	0	7	11	7	0	0	5	0	0	31	61	**623**
Czech Republic	1	1	0	14	0	4	27	0	0	2	7	0	0	0	0	0	0	6	2	**72**
Denmark	0	16	0	0	1	19	140	0	0	15	1	0	0	0	1	0	0	124	36	**952**
Finland	0	1	0	48	0	2	8	0	0	0	0	0	0	0	0	0	0	83	2	**287**
France	0	379	3	242	0	0	344	0	0	113	64	5	0	0	74	0	0	394	457	**3 084**
Germany	10	112	2	579	0	115	0	0	0	30	65	2	0	0	4	0	0	147	121	**1 759**
Greece	0	10	0	56	0	12	70	0	0	2	64	0	0	0	2	0	0	20	10	**337**
Hungary	3	0	4	4	0	4	12	0	0	0	4	0	0	0	0	0	0	1	0	**34**
Ireland	0	1	1	7	0	13	10	0	0	0	0	0	0	0	0	0	0	1	174	**220**
Italy	3	32	0	333	0	378	191	0	0	19	0	1	0	0	63	0	0	103	127	**1 626**
Luxembourg	0	35	0	3	0	26	7	0	0	0	1	0	0	0	4	0	0	2	3	**83**
Netherlands	1	307	0	155	0	46	345	0	0	13	9	0	0	0	3	0	0	47	95	**1 525**
Poland	1	3	1	103	0	11	112	0	0	10	2	0	0	0	0	0	0	378	19	**1 155**
Portugal	0	10	0	13	0	29	37	0	0	3	1	0	0	0	0	0	0	196	59	**641**
Slovak Republic	1	0	30	2	0	0	4	0	0	1	0	0	0	0	0	0	0	1	1	**40**
Spain	0	58	0	123	0	275	71	0	0	63	200	0	0	0	290	0	0	140	228	**1 905**
Sweden	0	5	0	237	20	2	19	0	0	5	0	0	0	0	3	0	0	0	7	**652**
United Kingdom	0	63	0	249	0	94	223	0	0	55	13	0	0	0	30	0	0	166	0	**1 495**
Non-OECD America	0	0	0	15	0	3	2	0	0	1	1	0	0	0	46	0	0	0	4	**464**
Non-OECD Asia	0	3	0	189	0	57	12	0	0	8	6	0	0	0	3	0	0	1	59	**2 925**
Non-OECD Oceania	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	**27**
Africa	0	8	0	26	0	87	6	0	0	57	23	0	0	0	36	0	0	0	38	**571**
World	26	1 064	48	3 109	45	1 527	2 219	0	0	442	662	16	0	0	610	0	0	2 028	1 855	**30 060**

1. Comprises codes SH 0302-0307, 121220, 1504, 1604, 1605 and 230120.

Source: OECD (2009), *International Trade Statistics Database*.

PART II

Eco-Labelling and Certification in the Fisheries Sector: Summary Report of the OECD/FAO Round Table

Eco-labels have emerged in the midst of the perception that public mechanisms at the national, regional and international levels are failing to adequately manage the sustainability of marine resources. As a market-based mechanism designed to improve fisheries management, eco-labels and the certification process raise a number of issues and challenges: how do they interface with governments' responsibilities to manage natural resources? How should standards related to "sustainability" be defined and developed? Should the various certification and eco-labelling schemes on offer be evaluated.

The OECD/FAO Round Table confirmed that the various stakeholders in the fisheries supply chain all have an interest in and are committed to sustainable fisheries. There was overall consensus that eco-labels have a role to play in creating greater incentive for better fisheries management. The challenge today is to ensure that the pressure and momentum generated by that market-based instrument can be harnessed to complement public measures for sustainable and responsible fisheries management. This means aligning the various incentives so that the private sector, NGOs and governments can work together. Eco-labels provide a nexus between marketing and management, and play an increasingly important role in fisheries sustainability.

PART II

Eco-Labelling and Certification in the Fisheries Sector: Summary Report of the OECD/FAO Round Table

II.1. Introduction[1]

Eco-labels[2] and related certification[3] schemes are becoming a significant feature of global fish trade and marketing. Buyers, especially large retailers and commercial brand owners, have embraced them. Commitments to source only fish and seafood certified as sustainable[4] are increasingly included in their procurement strategies and wider corporate social responsibility policies.

Eco-labels have emerged in the context of growing concerns about the state of the world's fish stocks, increasing consumption of fish and seafood, and a perception that public mechanisms at the national, regional and international levels are failing to adequately manage the sustainability of marine resources. As a market-based mechanism designed to improve fisheries management, eco-labels and the certification process sitting behind them raise a number of issues and challenges: from broad policy questions as to how they interface with governments' responsibilities to manage natural resources; to technical questions as how to define and develop standards related to "sustainability"; to detailed questions related on how to evaluate whether various existing certification and eco-labelling schemes are credible and robust.

In order to tease out some of these questions and to promote understanding amongst the various stakeholders in the eco-labelling arena, the OECD Committee for Fisheries and the FAO Fisheries and Aquaculture Department jointly organised a Round Table on Eco-Labelling and Certification in the Fisheries Sector. In co-operation with the Dutch Ministry of Agriculture, Nature and Food Quality, the Round Table was held in The Hague, The Netherlands, on 22-23 April 2009. The Round Table brought together 120 representatives from: the fishing industry (producers, processors, buyers, retailers), NGOs, eco-labelling schemes, certification bodies, academia, governments, and relevant international organisations.

II.2. Overview and key themes

The most striking feature of the Round Table was the apparent agreement amongst participants that eco-labels and certification have a positive role to play as an incentive to improve fisheries management. To date there has been little concrete evidence of the impact of eco-labelling and certification on improvements in fisheries management and sustainability. There was initial speculation that the first fisheries to be certified were those that were already well managed. Under that scenario certification was seen more as a marketing tool, aimed at increasing market share, extracting a price premium, and in the case of retailers including sustainability in their fish and seafood procurement policies, a tool for attracting and maintaining customer loyalty. After over a decade of experience, evidence is coming to light that suggests that eco-labelling and certification might indeed be leading to better fisheries management, albeit in some unexpected ways.

That certification of a fishery related to one area or species might encourage competitors to also seek certification has been previously documented. Other improvements such as significant reductions in by-catch and fewer impacts on eco-systems have also been noted. The Round Table heard examples of certification methodologies being used as self-assessment tools for fisheries, as a means to define gaps in performance and to set a roadmap for improvement, whether or not those operating in that fishery actually went on to seek formal certification. The Marine Stewardship Council's (MSC) pre-assessment in particular was highlighted. What is important in this context is how certification methodologies can be used to improve performance even in fisheries that for various reasons would be unlikely candidates for actual certification.

Participants also heard how gaps exposed in the assessment process often lead to pressure on governments to improve their performance, with implications for policy frameworks and resource allocation. Previous debates have highlighted the unease experienced by some governments at what is in essence private sector organisations passing judgment on their fisheries management frameworks and outcomes. Other high-level questions such as the implications for market access and international trade have also been raised. New policy questions emerged at the Round Table. In order for fisheries to be certified governments might have to invest in management improvements, some specifically related to pressure from the certification process, such as how related data is generated and made available. Governments might also feel pressure to invest in management improvements specific to the fisheries seeking certification when their existing policy framework would suggest those resources would be better spent elsewhere. Should public resources be spent on fisheries seeking certification, or on transitional fisheries to bring them up to the level of the best performers, or instead should efforts be concentrated on the worst cases?

Governments have taken quite diverse approaches to the eco-labelling question. Some of these were outlined at the Round Table and are described later in this report. What is interesting in the development of the eco-labels phenomenon is how they interface with public policy goals. Essentially eco-labelling schemes are private market mechanisms set up in response to perceived government failures in fisheries management. Fisheries operators are now using the certification process to put pressure on governments to address policy and administrative shortfalls. Governments are responding. Moreover, in some cases, governments themselves are using the private market mechanisms of eco-labels and certification to put pressure on their fishing industries to adopt more

responsible and sustainable fishing practices. That is, governments are using eco-labels as a means to promote traction in their own fisheries management policies. The mix of public and private mechanisms and the relative pressure they exert has interesting ramifications for overall governance.

The Round Table identified some gaps in the overall global governance for fisheries sustainability. While there are obligations in international law (UN Convention on the Law of the Sea), and internationally agreed guidelines to help implement those laws (FAO Code of Conduct for Responsible Fisheries) there are no internationally agreed sustainability standards or standards for fisheries management, and therefore no criteria against which governments can judge themselves and their fisheries management performance. The Round Table debated how to close this gap in the governance framework, and asked whether it is possible to arrive at some "aspirational" governance regime for sustainable fisheries management that would include principles of good public governance, as well as market principles and mechanisms, and the interplay between them.

The need for an assessment framework and benchmarking exercise to evaluate the various eco-labelling schemes on offer was a recurring theme at the Round Table. Such an exercise was deemed useful for the range of stakeholders: governments making investment or resource allocation decisions; retailers and brand owners as a basis for choosing suppliers; and for the fishing industry seeking both a tool for management improvement and the scheme most likely to offer market returns.

Rather than suggesting that the influence of eco-labelling schemes in global fisheries governance should be curbed or regulated, the Round Table focused on how the pressure and momentum generated by a market-based instrument could be harnessed to complement public measures for sustainable fisheries. A quote by one speaker, that sustainability was too important to leave to the market, and similarly too important to leave to policy makers, resonated with participants. Instead, the challenge is to align incentives so that the private sector, NGOs and governments can all work together towards the shared goal of sustainable fisheries management. The first step in that process is mutual understanding of the various demands, motivations and constraints on those stakeholders. The Round Table provided a unique and valuable opportunity for stakeholders to share their particular perspectives.

The Round Table clarified points of tension and key areas where further debate and action are required, including: the need for a more equitable distribution of the costs of certification; clarifying issues related to international trade and market access; the potential for integrated traceability mechanisms; and the importance of including developing countries in the eco-labels debate. Overall, these issues highlight a need to further clarify the roles and responsibilities of the public and private sectors in relation to eco-labels.

Although many of these issues are common to both capture fisheries and aquaculture, most of the Round Table discussion focused on capture fisheries. That imbalance is reflected in this document which attempts to give a flavour of the Round Table discussions. It first summarises the various perspectives of the stakeholders present; buyers, the fishing industry, those involved in eco-labelling and certification, and governments. It then discusses frameworks for and gaps in the global governance for fisheries sustainability and highlights areas where participants suggested further dialogue or action is required. The conclusions set a potential agenda for the work of the OECD Committee for Fisheries and the FAO.

II.3. Stakeholder perspectives

In response to the question, "Who should assume responsibility for ensuring fish stocks are not overused?" Sixty-seven per cent of the respondents to a worldwide consumer survey said "governments", 46% said the "fishing industry", 28% said "fish manufacturers and processors", and 16% said "retailers of fish products".[5] In the public mind therefore, while governments have the primary responsibility for fisheries sustainability, it is a responsibility that they believe should be shared with other stakeholders in the supply chain. All of those stakeholders have an interest in the shared goal of sustainable fisheries. The Round Table offered them an opportunity to share their different motivations and risk profiles and how these shape their approach to eco-labelling and certification.

Buyers: Developments in the branding and marketing of fish and fish products

Market research shows that supermarkets are increasingly dominant in the retail of fish and seafood products. Large supermarkets require stable supplies of good quality safe product. Increasingly they are also requiring their suppliers to prove that those products have been sourced ethically. Eco-labels provide this «burden of proof». Sustainability is becoming an important pillar of retailers' (and brand owners») fish and seafood procurement policies.

In terms of retailing and marketing, fish is considered more complex than all of the other food groups put together.[6] The "explosion" of fish-related labels and certification, in particular related to farmed fish, is adding to that complexity. The range and diversity of eco-labels has created what was described at the Round Table as "eco-label noise".[7] It was argued that consumers find the wealth of different messages confusing; they increasingly put their faith in trusted retailers to define the boundaries of their ethical purchasing decisions. Retailers and brand owners filter the various messages and through "choice editing" decide which standards or labels to include in their procurement and marketing strategies.

Eco-labels are only one group of private standards: a range of certification schemes and labels exist in fisheries and aquaculture, relating to factors such as safety and quality as well as to ethical differentiators (organics, buy local, fair trade, social development, animal welfare). The more private standards adopted, the more supply chain costs accrue, and the more complex is the procurement model.

Retailers are becoming the dominant actors in the food industry generally and have increasing bargaining power *vis-à-vis* other actors in the supply chain. Retailers "private label" products are competing with those of large commercial brands. For their part, large commercial brand owners are both driving and responding to the demands for certified fish and seafood products. A senior manager responsible for sustainability for a large commercial brand explained that he currently manages some 45 sustainability targets across that business, including specific commitments to sustainable fish sourcing. Apart from these in-house targets, he also has to respond to the demands of retailers. If supermarkets have commitments to different eco-labelling schemes, or even different schemes for different markets, he has to respond to them.

Sustainability is difficult to market. It is becoming clear that despite consumers' stated interests in the environmental impacts of their purchasing decisions, their actual buying behaviour, especially in relation to food, is more likely to be determined by other factors. The current global financial crisis has seen consumer confidence fall[8] and their behaviour increasingly influenced by price. The industry therefore cannot rely on consumers being

prepared to pay a price premium for sustainable fish and seafood. Affordability has to be built into the equation.

It appears that it is no longer consumers and NGOs pressuring retailers to adopt sustainability targets or to include eco-labels in their procurement strategies. On the basis of what was described as "enlightened self-interest" retailers and brand owners are now driving demand for suppliers to be certified against one or other eco-labelling or certification scheme. Eco-labels work as a marketing tool to protect and enhance the overall value of the brand or supermarket chain. When they also have a comprehensive assessment model and effective chain of custody systems sitting behind them, eco-labels offer additional guarantees of traceability and good governance. MSC in particular appears to be attractive to buyers because it operates as a management tool in the marketplace and among other things reduces the need for buyers to conduct their own expensive validation/audit processes of suppliers. However, when supplies of certified fish and seafood fall short of the demand for them, retailers and brand owners will still source uncertified product, but on the basis of their own assessments of the sustainability of related stocks.

From the perspective of buyers some alignment of eco-labelling schemes, or at least some sort of framework against which to judge the quality and credibility of the various fisheries certification schemes in the marketplace, would be useful. This became a recurring theme throughout the Round Table. From the perspective of buyers a suggested "wish list" for fish certification schemes was proposed,[9] incorporating the following aspects:

- Does it operate to an internationally agreed or harmonised reference, such as the *FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries*?
- Is the certification process compliant with relevant international standards, *e.g.* EV450011, ISO65, ISEAL?
- Is the governance and transparency of the organisation/standard robust?
- Does the issuing organisation have credibility (related to the above)?
- Is the scheme easily used by industry (*e.g.* easily understood using simple language)?
- Is it affordable? Does the cost structure incite the market to adopt the standard?
- Is a continuous business improvement process built into the scheme?
- Do its label declarations align to international standards (*i.e.* ISO14020 aspects)?

There was also a call for more clarity in describing what is a sustainable fishery based on claims that the FAO terminology ("recovering", "depleted", "overexploited", "fully exploited", "moderately exploited", and "underexploited") was liable to confusion and was often misrepresented in the media and by NGOs. In particular, the term "exploited" has pejorative connotations.

Private eco-labelling schemes: How they function

In contrast to buyers' concerns about "eco-label noise", other participants argued that there were not "too many eco-labels". While there is no formula to define an optimal number of labels and certification schemes, there was agreement that too many labels would lead to confusion, but too few might lead to a monopoly situation. Domination by one label could leave the industry vulnerable to definitions of sustainability that could change over time, or to a ratcheting up of requirements. Transparent and good governance of certification schemes is imperative.

The Round Table agreed that rather than debate the merits, or lack thereof, of too many or too few labels, the discussion should focus on the quality of information, or the relative "credence value", of the range of labels on offer: are they truthful, legitimate, transparent, robust, and consistent with the *FAO Guidelines on the Eco-Labelling of Marine Capture Fisheries*? This echoed the calls, outlined above, for some methodology to assess the quality of any given eco-labelling scheme.

Four private eco-labelling and certification schemes gave presentations at the Round Table: the Marine Stewardship Council (MSC, *www.msc.org*), Friend of the Sea (FOS, *www.friendofthesea.org*), KRAV (*www.krav.se*), and Naturland (*www.naturland.de*). Their presentations are briefly summarised below.

Marine Stewardship Council (MSC)

The Marine Stewardship Council was established in 1997, initially as a joint project between the World Wildlife Fund (WWF) and Unilever, but independent of them since 1999. MSC focuses on wild capture fisheries (not aquaculture). It claims that 8% of the world's edible wild capture fisheries are engaged in the programme, covering 5 million tonnes of seafood in all, representing by species some 42% of the global wild salmon catch and 40% of the global prime white fish catch.

MSC is a standard setting body. Certification to the MSC standard is carried out by independent, third-party, certifiers. MSC's "Fisheries Assessment Methodology," and "standardised assessment tree" focus on three pillars: independent scientific verification of the sustainability of the stock; the eco-system impact of the fishery; and the effective management of the fishery. All three pillars are assessed on the basis of a range of indicators. Aspects related to the species, the fishing gear used, and the geographical area, are all included in the assessment. The unit of certification can be an entire fishery or a component of a fishery. Where the client is a component of a fishery, the entire fishery and its management is still assessed in order to evaluate the impact of that sub-group. The comprehensive nature of the MSC assessment is reflected in the time and the cost of certification. Where management changes are required, the certification process can take years; the cost of a full assessment can range from EUR 10 000 to EUR 100 000.

MSC adjusted its assessment model in the light of the development of the *FAO Guidelines for the Eco-Labelling of Fish and Fishery Products from Marine Capture Fisheries* (2005), and conducts regular internal audits to ensure it maintains consistency with those guidelines. In response to concerns that the MSC methodology was not applicable to data deficient fisheries (with particular implications for developing countries) it is conducting trials on a risk-based assessment model specifically adapted to those environments.

The Round Table heard that the MSC's pre-assessment (and even a pre-pre assessment) methodology – which was initially designed to assess the potential of a client fishery for full assessment – is being used by fisheries as a self-assessment tool, to define gaps in performance and to set a roadmap for improvement, even where there is no intention of seeking full assessment or certification. The methodology is available and can be used by any fishery with results remaining confidential (any assessment only becomes public once the fishery has entered the full formal MSC assessment process).

MSC's presence and credence in the market was evidenced by the extent to which it was the scheme most often discussed at the Round Table.

Friend of the Sea (FOS)

Friend of the Sea was established in 2006 with links to the Earth Island Institute, which is also responsible for the Dolphin Safe label. FOS has standards for wild capture fisheries and aquaculture fish and seafood products, including fishmeal. It claims to cover 10% of the world's wild capture fisheries.[10]

FOS incorporates Greenpeace's criteria on social accountability, has requirements related to carbon footprint, and will also certify products as organic. Its certification methodology is based on official data in terms of stock assessment. The certification process involves a preliminary assessment of the candidate by the FOS advisory board (usually taking 1 week). From there an independent certification body evaluates existing official stock data (1 day), following which a local on-site audit is conducted (2-10 days), and a traceability assessment is carried out (1 day). Audit of an aquaculture facility takes a maximum of 1 day; audits are carried out once every three years.

KRAV and Naturland

KRAV and Naturland both originated as organic labels but have recently developed frameworks for the certification of capture fisheries.

KRAV is a long-standing Swedish organic label that has developed a "standard for sustainable fishing." Assessment against that standard includes a stock assessment, certification of vessels, an audit of fishing techniques, as well as audits of landing and processing facilities to ensure traceability and chain of custody guarantees.

Naturland was established in Germany in 1982 to certify organic farming. It later included aquaculture in that scheme and more recently has added a "Scheme for Certification of Capture Fishery Projects". Projects are undertaken on the basis of social, economic and ecological sustainability criteria. Naturland described one of its projects, "Eco-labelling of Nile Perch from Bukoba" in Tanzania, which far from a simple assessment of a fishery for certification purposes was a hands-on development project, carried out in partnership with the German Agency for Technical Cooperation (GTZ), a Dutch importer, a Tanzanian processor/exporter and more than 350 local fishers. A holistic approach was taken to improving the sustainability of this segment of the Lake Victoria fishery; the project included aspects such as the introduction of a mobile health service and options for diversifying employment opportunities. The MSC pre-assessment methodology was used as a basis for the initial assessment of the fishery and the development of a roadmap for management improvement.

Can they be compared?

The presentations by the eco-labelling schemes highlighted the difficulty of conducting any benchmarking exercise to compare the quality and credence of one against the other. The various eco-labelling schemes are certifying different things. Their assessment methodologies differ considerably. Moreover, the certification process can be used for different purposes. Friend of the Sea concentrates on the sustainability of the stocks themselves: does the product come from a sustainable stock? MSC in contrast concentrates on whether the product comes from a fishery that is sustainably managed. The former approach offers a simple pass/fail result while the latter can be used in capacity building exercises including designing improvements in transitional fisheries. Both KRAV

and Naturland offer opportunities to use a certification process in the context of a social and economic development exercise.

The eco-labelling schemes themselves agreed that they were not doing the same thing and that it would be dangerous to see them as inter-changeable. However, several of the schemes present at the Round Table welcomed any exercise to benchmark the range of schemes against the *FAO's Guidelines for the Eco-Labelling of Fish and Fishery products from Marine Capture Fisheries*.

In response to a question about label fraud, all the schemes reported that they had seen no evidence of products being labelled fraudulently.

Fishing industry: Benefits and burdens

The capture segment of the fishing industry seems to be resigned to the existence of eco-labels and increasingly sees certification as a "cost of doing business" in today's international markets for fish and seafood. Fisheries seek certification when the market demands it. Buyer procurement strategies based on fish and seafood certified as sustainable is a key driver, especially when those buyers, like Wal-Mart, account for enormous volumes of sales.

For fishers the benefits of certification have been portrayed as: access to new markets, consolidation of position in existing markets, and potential price premiums. After more than a decade of experience it could be argued that the evidence of these gains related to marketing might have been exaggerated, but other longer term gains related to management are starting to emerge.

There is only spotty evidence of a price premium accruing to certified fish and seafood. Some examples of fisheries enjoying if not a price premium then less price volatility were given at the Round Table, perhaps related to more direct supply relationships. In contrast, there was also evidence of retailers recognised as "discounters" offering certified fish. As noted above, buyers claim that consumers are not prepared to pay extra for certified fish. Elusive price premiums might therefore not be an effective "incentive" for fisheries to seek certification.

As noted earlier some transitional fisheries are using certification methodologies – such as the MSC pre-assessment – to initiate management improvements and subsequently to put pressure on governments for assistance in that process. Fisheries implementing management improvements as a condition of certification are further evidence that certification can be as much about management as about marketing. Management improvements can lead to more efficient production with gains that are more long term than those that can be realised in current market conditions; maintaining healthy stocks to enable future fishing is the ultimate reward.

The Round Table also heard from fisheries considering they were already well managed prior to certification, and claiming that the certification process made no difference to their management processes. This may have been the case for the first batch of fisheries gaining certification; they sought certification as proof that they were well managed, essentially for marketing purposes. The Alaska salmon fishery is a case in point. Indeed the Alaska salmon fishery has chosen not to seek re-certification to the MSC scheme on the basis that they already have credibility in the market as being well managed and sustainable. How this will impact on their position in the market and on competitors in the same market will be interesting to monitor.

The Round Table offered advice to the fishing industry, that regardless of their particular context they needed to check the value of any eco-labelling scheme, and the preferences of potential customers and markets, *before* embarking on any certification process.

Other issues related to certification process were raised, including the following:

- the extent to which producers shoulder an unfair share of the cost burden associated with certification;
- a lack of consistency among certifiers: producers have complained that the ride towards certification is easier for some than others as a result of different certifiers applying standards in a more or less rigorous fashion.

The discussion of these two issues is described in more detail later.

Government perspectives: The role of public authorities in eco-labelling

Governments' overall interest in sustainable fisheries is to ensure food security for current and future generations. The protection of the public goods of fish stocks and related eco-systems is an important part of that equation. At another level, governments have to ensure that the conditions are right for their fishing industries to compete in international markets, where eco-labels are increasingly a part of buyer specifications and a factor in market access.

Governments represented at the Round Table have taken diverse approaches to the eco-labelling question. These are briefly described here.[11]

The Netherlands

For Minister Verburg, the Dutch Minister of Agriculture, Nature and Food Quality, certification of fish and fish products can provide an important contribution to sustainable fisheries. She stated that, although certification is a market responsibility, in order to further stimulate sustainable fisheries she has decided to facilitate certification of the Dutch fishing industry. She announced that she had recently made EUR 1 million available for this. In his closing address the Dutch Ministry representative acknowledged that because government regulatory measures had not achieved the required results it would be sensible to use private sector mechanisms to incite better fisheries management. This is one of the most explicit examples of a government utilising an eco-label to pursue its public policy goals.

France

In contrast, rather than endorsing any particular private scheme, the French Government has chosen to create its own national eco-label and related certification scheme. This decision was based on a feasibility study[12] undertaken in 2008 by the responsible French authority, FranceAgriMer. As part of that process, it examined existing private eco-labels, including for consistency with the FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries. It concluded that of the existing eco-labels, only MSC was fully compliant with those guidelines. However, it also concluded that the MSC model would not fit all fisheries. It decided to adopt a public framework to meet the needs of its fishing industry as defined by the feasibility study; a scheme that was less costly than MSC, easily recognised by consumers (along the lines of the French public quality label, Label Rouge), and one that was consistent with the FAO guidelines but went beyond them with the inclusion of social and economic criteria. The label will be operational by the end

of 2009. Notably the public label will not preclude the certification of French fisheries to other private eco-labels. Indeed certification to other labels will be encouraged; five French fisheries are currently in assessment with the MSC.

Iceland

The Icelandic fishing industry (*www.fisheries.is*), with public support, has developed an Icelandic "logo" based on Iceland's "Statement on Responsible Fisheries in Iceland" (signed in partnership by both government and the fishing industry). While both partners, the Icelandic industry and government, are convinced that its fisheries management is sound and that the Icelandic industry is engaged in responsible fishing, they realised that they needed some mechanism for offering "proof" or documentation that this was the case. The Icelandic logo will be a label of origin but with reference to sustainability. Certification will be conducted by an independent internationally recognised and accredited certification body, which will in essence involve third party certification of the government's performance in fisheries management. The certification body will assess fishery conformance to a specification based on the FAO guidelines. The first assessments will be conducted by 2010.

European Union

A presentation by the European Commission revealed that it was currently undertaking a revision of the existing European generic eco-label, the "Flower" label, which includes a proposal for that scheme to apply to fish and aquaculture. Overall the European Union will continue two existing policy pillars in relation to eco-labels: the Flower label, and the establishment of minimum criteria for voluntary eco-labelling schemes in fisheries, based on the FAO guidelines. The European Union also has resources available for environmental projects.

In addition to these examples, there are countries where the approach has been to consider eco-labels and certification as private contracts, and hence has chosen not to participate directly in the private sector certification of fisheries (although the relevant public body will provide information and data to both fisheries applicants and certifying bodies). One country seemingly sits somewhere between the hands-on approach and the hands-off approach. It has introduced management changes in the light of its industry's engagement with eco-labelling, such as redesigning data systems to fit the information demands of certification, and taking steps to reduce administration and transaction costs.

II.4. Issues arising

Whatever approach governments decide to take towards eco-labelling and certification, they need to be cognisant of the implications of that decision. If they decide to endorse a particular private scheme that has current credence and acceptance in the market, does that imply a contingent liability if at some point in the future that scheme fails to deliver promised gains or ceases to exist? Does it transfer too much power to the private sector – with implications for policy sovereignty – especially if demands and requirements ratchet up over time? In contrast, developing a national eco-label is expensive and may not be accepted by the market. Ultimately it is large-scale buyers and their choice of which schemes they require their suppliers to be certified to, who decide which eco-labels gain traction in the market. Key policy dilemmas were highlighted at the Round Table and are outlined below.

Resource allocation and policy frameworks

Fisheries seeking certification are putting pressure on governments to allocate resources to areas and/or activities that may not be entirely consistent with existing policy frameworks and trajectories. Governments have to decide if they should allocate resources accordingly, either financial or in administrative and policy "effort"; such as providing data, creating new data streams, conducting scientific research, and creating and implementing the "conditions" required for certification (which may include requirements to change management settings and/or surveillance). These responses to certification conditions might affect the pace and timing of ongoing fisheries management reforms.

Responses to eco-labelling and certification should ideally be consistent with overall management policy frameworks. If that management framework is based on principles of cost-recovery, should the costs of the responses to certification be recovered from the eventual beneficiaries? On the other hand, if fisheries seeking certification fail because the assessment process reveals deficiencies in the overall public management of fisheries – a government responsibility – should governments foot the bill?

Equity and fairness

It is currently relatively cheaper, assuming economies of scale, for a larger fishing firm or larger fishery to achieve certification. If that means that smaller firms competing in the same fishery, or fishers operating in smaller or data poor fisheries, are shut out of lucrative international markets, governments will be called on to deal with resulting equity issues. Do eco-labels and certification exacerbate the market power and position of big players? If so, should governments help smaller operators by creating a level playing field to allow them to compete? Governments might also be called on to assist fishing operators facing high-risk markets, or those markets where demands for certification are more prevalent (demands for certification tend to be stronger in some markets and species than in others). How should impacts on trade and access to international markets influence governments' responses to eco-labels and certification? Under another scenario, less sustainable fisheries may be competing for scarce public resources against fisheries seeking certification or even recertification. Where should efforts be focused; on poor performers, on transitional fisheries, or on fisheries likely to bring in export earnings? What is a "fair" allocation of public funds for demands driven by a private market-based mechanism?

Which, if any, labels to invest in?

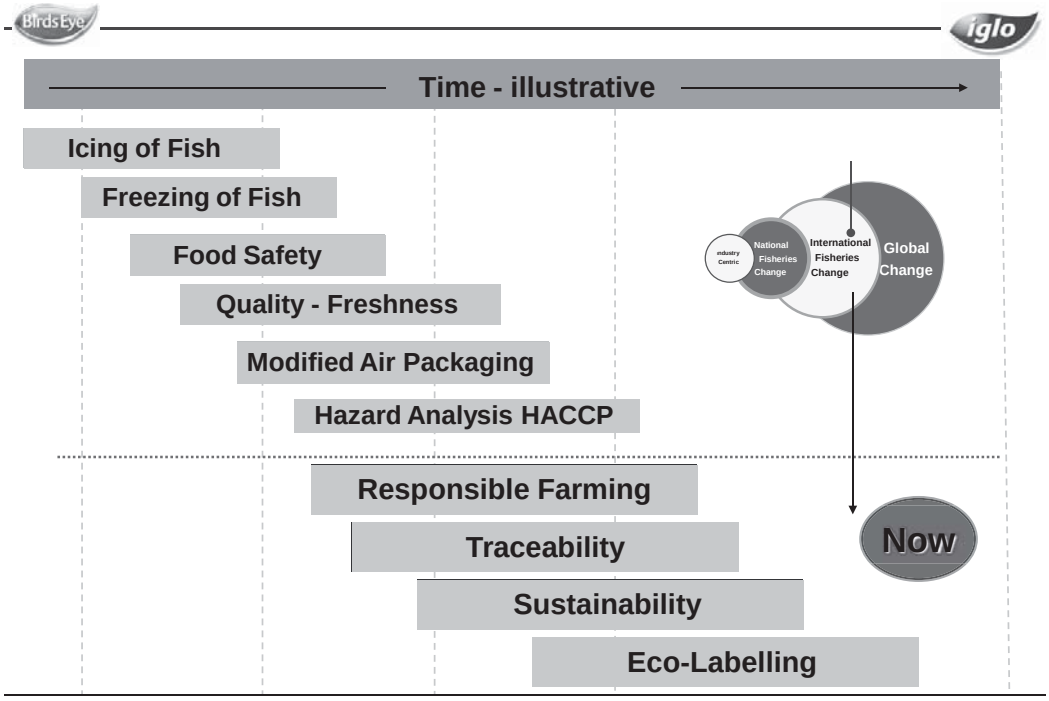
If governments decide to actively engage in the eco-labels phenomenon, other issues arise. Should resources be available to fisheries seeking certification to any and all eco-labels or should governments play a role in deciding which are the more robust and credible labels? In order to decide whether or not to invest resources in certification and labelling of fisheries, governments need to judge which labels are preferred by buyers and therefore affecting trade opportunities. Will there be an ongoing market for certified products? Is the eco-label and associated standard stable and legitimate? What levers, if any, do governments have to ensure ongoing good governance in a private scheme?

These questions again highlighted the value of some sort of benchmarking of the various eco-labelling schemes on offer. Moreover, it also underscored the need for governments to consider, individually and collectively, the essential components of an overall governance framework for sustainable fisheries, and how private market mechanisms might fit into that framework.

II.5. A framework for global governance of fisheries sustainability

Eco-labels are a relatively recent development in fish trade and marketing. One presentation[13] at the Round Table put the development of eco-labelling into the context of the overall development of global governance of the fishing industry; that eco-labelling can be seen as part of a continuum; from a "market driven phase" to an aspirational "shared responsibility phase". It was suggested that this evolution might follow that occurring in the food safety arena.

Figure II.1. **Current "change phase" of fish industry**



Source: P. Hajipieris, *Birds Eye Iglo*.

The FAO[14] presented the elements and history of the international framework for food safety governance. Numerous comments from the floor concurred that public and private management frameworks for food safety and quality might offer some pointers for developing a framework for global governance related to fisheries sustainability. Given the particular risk profile of fish as a commodity, managing both the food safety and the sustainability aspects is highly complex.

International framework for food safety governance

The joint FAO/WHO Codex Alimentarius (Codex) plays a crucial role in setting international standards and norms for food safety. It is the global reference point for national food safety agencies. The food safety management system, HACCP (Hazard Analysis and Critical Control Point) is recommended by Codex and is mandatory in many countries. The Codex Committee on Fish and Fishery Products (CCFFP) developed a specific code of practice on how to adapt HAACP principles and practices to fish and seafood safety and quality along the value chain. In addition, the WTO's SPS (Sanitary and Phytosanitary) and TBT (Technical Barriers to Trade) Agreements encourage harmonisation and mutual

recognition of food safety standards as part of its regulatory framework to facilitate global trade. Codex is referred to explicitly in the SPS Agreement and implicitly in the TBT Agreement. It has been referenced in trade disputes. Other international standards organisations are also relevant, in particular the International Organization for Standardization (ISO) (in particular for certification and accreditation).

In addition to these public mechanisms, there is also a range of private food safety and quality schemes. Many of these schemes are driven by coalitions of retailers. In practice they operate increasingly as international standards as they define the relationships between globalised firms and the international suppliers to those firms. Similar issues have been raised in the food safety area as have been raised in relation to eco-labels and certification. What are the various roles of the public and private sector in food safety governance? How are costs divided amongst the various stakeholders? And what are the impacts on small-scale operators and developing countries if they fail to meet public let alone private sector requirements?

Food safety governance versus *sustainability governance*

The current global framework for food safety governance however is several decades ahead of the fledging framework for fisheries sustainability; Codex was created in 1963 and has evolved in line with new developments in science and technology.

In contrast, in the fisheries sustainability area the development of a framework for global governance only began in the 1980s. To date it includes, *inter alia*:

- the United Nations Convention on the Law of the Sea (UNCLOS) (1982);
- the FAO Code of Conduct for Responsible Fisheries (CCRF) (1995);
- the United Nations Fish Stocks Agreement (UNFSA) (1995);
- various regional fisheries management organisations (RFMOs); and
- the *FAO Guidelines for the Eco-Labelling of Fish and Fishery Products from Marine Capture Fisheries* (2005).

In the sustainability area while there are obligations in international law (UNCLOS), and internationally agreed guidelines to help implement those obligations (CCRF), there are no internationally agreed sustainability standards, or standards for fisheries management. Therefore, there are no criteria, beyond those contained in the CCRF, against which governments can judge their own performance in fisheries management. The dearth of scientifically based standards for stock management and agreed definitions of sustainability make global governance of fisheries sustainability more problematic than managing for food safety where operational standards are well established.

In terms of private standards, those related to safety/quality and those related to sustainability (eco-labels) also differ. Private safety/quality schemes are largely based on internationally agreed standards and management systems; for example, they all claim to be based on Codex, include HACCP, and incorporate agreed ISO principles for certification and accreditation. Many were developed to help operationalise international food safety standards and to verify compliance against them. In contrast, many eco-labelling schemes *preceded* any public standard or guidelines specifically related to eco-labels. Indeed, the FAO guidelines on eco-labels were developed *in response* to an anticipated proliferation of private eco-labelling schemes. Moreover, in the face of a proliferation of private food safety management schemes, an international coalition of retailers – through the Global Food Safety Initiative (GFSI, *www.ciesnet.com*) – has benchmarked the main private schemes as a

first step towards, if not harmonisation, then mutual recognition of those benchmarked schemes. Several Round Table participants drew attention to the GFSI as a potential model for benchmarking eco-labelling schemes.

Finding the missing piece in the governance puzzle

What a comparison of the two areas – safety/quality and sustainability – suggests, however, is that in the sustainability area a piece of the governance puzzle is missing.

A key question was put to the Round Table: "Is it time to think about developing some standards for fisheries management that go beyond the current Code of Conduct for Responsible Fisheries?" Indeed, would it be possible to build a "theoretical" or "aspirational" governance regime for sustainable fisheries management that would include principles of good public governance, as well as market principles and mechanisms, and the interplay between them? This would reflect the aspirational "shared responsibility phase" referred to above.

There was some agreement that the MSC's "Fisheries Assessment Methodology" and related "standardised assessment tree" is currently the most useful methodological tool for assessing whether a fishery is sustainably managed. MSC revealed that it attempted to develop an overall generic assessment model to assess a country's entire management system but came up against what it described as a "roadblock".[15] Several participants argued that governments, not non-governmental organisations, should be taking the lead in this area. Efforts to develop standards for fisheries – defining the essential elements of the "infrastructure" for an effective fisheries management regime – and a related assessment model, based on the Code of Conduct for Responsible Fisheries, would be best placed in an intergovernmental organisation where the process would be transparent, participatory and the outcomes subject to international agreement. There was a suggestion that FAO would be the appropriate forum for further work in this area, having both the relevant expertise and legitimacy. In any case, these issues require further debate. The OECD and the FAO will consider them as part of their ongoing work programmes.

Scope of sustainability definitions

However, when "sustainability" will be defined, the definition must be transparent, consistent with multilaterally agreed standards, standardised, and comprehensive. The Round Table urged caution in attempting to build broader aspects of sustainability (like economic and social sustainability) into an internationally applicable definition applying to fisheries and aquaculture. While these aspects are important at the operational level – particularly in developing countries where adjustments to fisheries management practices will fail if the social and economic impacts are not taken into consideration – they should not be built into an overarching definition or criteria.

If retailers, through choice editing, start to include other ethical differentiators in their fisheries procurement policies – carbon footprint, animal welfare, social equity were all mentioned but not widely discussed – the definition equation might have to be reconsidered. In the meantime, it was agreed that certification for aspects where there are no agreed definitions, standards, or assessment methodologies are liable to cause confusion.

Benchmarking eco-labelling schemes

While there are no operationalised standards for sustainability or sustainable fisheries, the FAO Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries are seen as providing acceptable minimum criteria for eco-labelling schemes, against which eco-labelling schemes could be benchmarked. The main aspects of the guidelines were outlined at the Round Table and are repeated here.

FAO Guidelines for the Eco-Labelling of Fish and Fishery Products from Marine Capture Fisheries

The voluntary FAO guidelines include minimum substantive requirements and criteria for any fisheries eco-labelling scheme. They also define the procedural and institutional aspects of any scheme. Any scheme should include the requirements that:

- the fishery is conducted under a management system that is based on good practice including the collection of adequate data on the current state and trends of the stocks and based on the best scientific evidence;
- the stock under consideration is not over-fished; and
- the adverse impacts of the fishery on the eco-system are properly assessed and effectively addressed.

In terms of procedural and institutional aspects, any eco-labelling scheme should encompass:

- the setting of certification standards;
- the accreditation of independent certifying bodies; and
- the certification that a fishery and the product chain of custody are in conformity with the required standard and procedures.

Designing an assessment methodology

Round Table participants concurred that a methodology for testing the relative merits of the various schemes would be useful for the range of stakeholders: governments making investment decisions, retailers and brand owners as a basis for choosing suppliers, and for the fisheries industry seeking both a tool for management improvement and the scheme most likely to offer market returns.

Some benchmarking exercises have already been undertaken.[16] As noted above, the French authority, FranceAgriMer conducted an evaluation of existing eco-labelling schemes as part of its process to determine whether or not to develop its own public eco-label; it concluded that MSC was the only scheme consistent with the FAO guidelines. The UK Seafish Authority is leading an international process to study various eco-labelling schemes; it will report later in 2009. At the Round Table there was a suggestion that the parent body of the international retail consortium – CIES – responsible for the GFSI benchmarking of private food safety management schemes, might take on such a task. A participant with direct links to CIES considered that while CIES would probably be interested in being involved in such an exercise it was unlikely to want to lead it. It was also noted that many retailers do not have specific expertise in the fisheries area.

As noted earlier, although most eco-labelling schemes claim to be consistent with the FAO guidelines, there is currently no agreed framework for assessment or for benchmarking them. There have been calls for the FAO to conduct such a benchmarking

exercise. The legal implications of carrying out such an exercise and its consistency with FAO's mandate, as well as different approaches to the benchmarking question will be discussed at a forthcoming meeting of the FAO's Sub-Committee on Fish Trade. The development of an assessment or benchmarking methodology, without carrying out the benchmarking itself, will be one option discussed.

Any benchmarking exercise would have to be transparent and independent; the FAO or some other multilateral organisation would seem the most appropriate forum for such an activity. The need for a separate or integrated process for private standards related to aquaculture was also raised but not debated. Interested countries will need to pursue the idea further in the context of the FAO's current work on certification in aquaculture.

II.6. Areas requiring further debate

The Round Table also highlighted a number of areas where tensions exist currently in the operation of eco-labelling and certification and require resolution. These include:

- the costs of certification and who pays for what;
- the impacts of eco-labels on international trade and market access;
- ensuring eco-labelling is inclusive of developing countries and more generally data deficient fisheries;
- the potential for integrated traceability and opportunities for developing synergies and reducing costs; and
- the quality, consistency and capacity of certifiers.

Costs of certification: Who should pay for what?

Producers in particular complain about the costs of certification to an eco-labelling scheme. The costs vary enormously depending on the scheme chosen, and even in relation to the same scheme depending on the size and complexity of the fishery. As perhaps the most comprehensive scheme, in that it assesses the overall fishery and its management, the cost of certification to MSC could vary between EUR 10 000 and EUR 100 000. This would be prohibitive for many small operators; developing countries in particular have raised concerns about costs.

MSC reiterated that it is the standard owner and not the certifier and therefore does not receive the revenues from certification. Certification costs vary according to certifiers and their audit fees. MSC only receives revenues from the use of the MSC logo (the logo fee amounts to some 0.05% on the wholesale price of fish coming from a certified fishery). MSC further argued that costs should fall as a result of improvements to its decision tree that leaves less room for certifier interpretation. Certifiers present concurred with this and argued that as they became more familiar with the criteria of any scheme, they also became more efficient and hence could contain costs.

Arguably more problematic than the actual costs of certification is the distribution of those costs. Currently the costs of certification are generally borne by harvesters. The "distribution of costs" issue is particularly acute when the improvements required, or "conditions of certification", relate to the overall management of the fishery, which is generally the responsibility of public authorities. If fish from a particular fishery is excluded from a market or buyer (one requiring only certified product) on the basis of judgments about whether a government has lived up to its obligations for sustainable

fisheries management, then who should pay for improvements? An Non-Governmental Organisation (NGO) representative told the Round Table that never have industry and NGOs been more in agreement that when the costs of certification relate to government policy failure (poorly managed fisheries) then regulatory agencies should assume a fair share of the financial burden. The flip side is that when fisheries are well-managed, the fishing industry benefits from easy certification.

Costs also need to be seen in the context of potential benefits. Cost/benefit analysis is difficult because the costs of certification are typically short-term while the benefits might accrue only in the long-term. As noted earlier any price premium accruing to certified fish and seafood is typically too low or insignificant and hence is not likely to offset the costs of certification or related management improvements. However, in the long-term fish and seafood from well-managed fisheries should be cheaper to produce, so operating costs should be lower. Management improvement – either overall management or fishery specific – is a long-term investment.

As noted earlier, some governments use public funds to help pay for the costs of certification. This too raises issues of «who benefits?» Is it possible to define a formula whereby industry pays the component of certification that relates to private benefit (market access, price premiums), and government pays the component that relates to its responsibilities to manage marine resources sustainably? It appeared that countries where there was ongoing dialogue between industry and government were further ahead in their thinking on these issues. This would be another area where further international dialogue and sharing of experiences would be useful; broad stakeholder participation in those discussions would seem sensible.

Impacts on market access and international trade

The *FAO Guidelines for the Eco-Labelling of Fish and Fishery Products from Marine Capture Fisheries* state that voluntary standards, including eco-labels, should not distort global markets and should not create unnecessary obstacles to international trade. There was surprisingly little discussion on the impacts of eco-labels on international trade at the Round Table. However, a few key issues were raised.

It was acknowledged that eco-labels are becoming a market access issue. In some markets, market access for fish and seafood is increasingly determined by certification requirements driven by large-scale buyers. Requirements for only certified fish and seafood could mean that products can be excluded from the market due to perceptions of the buyer/retailer about whether governments (from exporting countries) have lived up to their obligations for good management. What recourse governments have to challenge these assessments and the requirements themselves is still largely unknown. Related discussions have been held in the context of the WTO but to date there has been no formal clarification of the jurisdiction to challenge non-governmental actors in that forum.

Whether public sector financial support for eco-labelling certification could be considered a "subsidy" and/or notifiable in the context of WTO mechanisms was also raised. If governments pay outright for certification is that a subsidy to its industry? If it leads to a trade advantage or improved market access then should it be notifiable? However, if public funds are used only for developing the conditions or infrastructure (that is, overall improvements in fisheries management) that would ease the path to

certification, then the case is less clear. As noted earlier, several governments have "subsidised" the certification of their fisheries.

Do eco-labels constitute a barrier to trade? The Round Table agreed that they could be perceived as a barrier to trade, but given the resulting benefits for overall fisheries sustainability, maybe it was a necessary and beneficial one. Clearly there is a need for further discussion on these issues. In particular there is a need to consider whether eco-labelling schemes as they currently operate discriminate against developing countries. Standards, whether public or private, must be inclusive.

Developing countries: Participation is crucial

Almost 80% of world fishery production takes place in developing countries. Their exports represent about half of world exports of fish and fishery products by value and about 60% by volume (FAO, 2009).[17] The Round Table agreed that attempts to improve the management and sustainability of the world's fisheries would fail if developing countries were not part of the equation.

The relative dearth of representatives from developing countries meant that the impacts of eco-labels and certification on developing countries were not widely discussed. As described earlier, Naturland's[18] pilot project related to Nile Perch in Tanzania showed how an eco-labelling certification process could facilitate a wider development exercise with ecological, social and economic sustainability goals.

The Executive Secretary of the Lake Victoria Fisheries Organisation (*www.lvfo.org*) gave his views on the opportunities presented by eco-labelling for developing countries. He argued that the MSC pre-assessment methodology was an effective audit tool that could be used to identify necessary management improvements. The Lake Victoria Fisheries Organization sponsored a MSC pre-assessment (conducted by third-party audit in 2007/8), the results of which contributed substantively to the development of the Lake Victoria Fisheries Management Plan (2009-14). The pre-assessment indicated a lack of readiness for a full MSC assessment, but more importantly highlighted gaps and shortfalls in existing management strategies; for example, the need for a specific management and stock recovery plan. That information was used to put pressure on the public authorities to respond to shortfalls highlighted in the assessment and resulted in the development of an overall management plan. The presenter concluded that in terms of improvements in fisheries management, eco-labelling and other private standards, are not a substitute for but rather complementary to mandatory standards; he referred to government requirements as "the stick" and eco-labels and other market mechanisms as "the carrots".

A voice from the Round Table floor briefly raised some of the concerns expressed in other forums by developing countries; that certification was typically too costly and methodologies ill-suited to data-poor highly fragmented developing country fisheries, and that in many developing countries they were perceived as posing a serious barrier to market access and trade. These issues have been documented but were not debated at the Round Table. However, there was agreement that further effort was required to develop methodologies that are appropriate to developing country environments. As noted above, MSC is piloting a risk-based assessment methodology for data deficient fisheries. Many fisheries in developing countries might indeed be sustainable but do not have the data to prove it. This is also true for some artisanal fisheries in developed countries; an uncertified fishery does not necessarily equate to an unsustainable fishery.

The Round Table concluded that for both developed and developing countries there is a need to develop strategies for incentivising transitional fisheries; that is, some mechanism to reward positive change in fisheries working towards improved management but not at the point where they could gain certification to an eco-label, or to recognise good practice in fisheries that for some reason do not meet the criteria for eco-labelling but demonstrate responsible behaviour. In this context it will be important not to "lower the bar" by creating some second-class certification or label. During the development of the FAO's guidelines on eco-labels developing countries specifically argued against this.

Integrated traceability: Developing synergies and reducing costs

Fish and seafood certified to an eco-labelling scheme does not always end up as a labelled product on sale to the consumer. While many eco-labelling schemes are designed as business-to-consumer models (based on the notion of consumer choice driving the demand for sustainable fish), increasingly it is the business-to-business part of the model that carries the most value. The certification process rather than the label is the important element and in particular the traceability guarantees that the process offers to retailers and brand owners promoting sustainability in their procurement and corporate social responsibility strategies. Traceability is key to the success of any eco-label. It is the guarantee that the fish and seafood on sale actually comes from a fishery certified as sustainable.

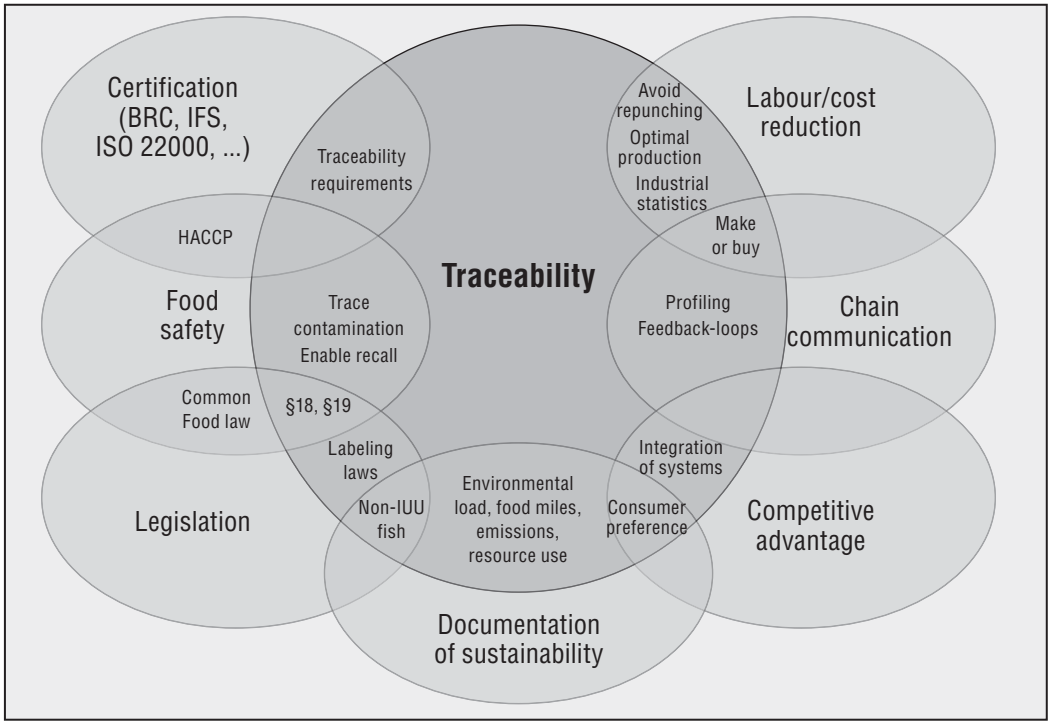
Round Table participants heard two presentations related to traceability. Traceability is the ability to track the origins of a product, the processes it went through, and where it ended up; in the case of fish and seafood – from boat/farm to fork. Chain of custody is a more specific concept and guarantees not only the ability to trace products but also to ensure their integrity throughout the value chain. In terms of eco-labels, chain of custody includes guarantees that certified product is not mixed with non-certified product.

Traceability systems are well established in the fisheries sector, in particular in relation to food safety, but also to catch certification, country of origin, and mechanisms for illegal, unregulated and uncontrolled fishing (IUU). Traceability is also a significant feature of private safety/quality standards and schemes. Various stakeholders in the fisheries value chain therefore face multiple public and private traceability requirements, each with their own requirements for verification and documentation (Figure II.2).

Are integrated traceability systems serving multiple purposes possible and feasible? Is it possible to have one system that would serve multiple uses: food safety; catch certification; IUU and the chain of custody aspects of eco-labels?

Integrating traceability systems for multiple purposes – both public regulation and private certification schemes – would help to reduce the costs currently associated with multiple verification systems and documentation. Technical tools, computerised and internet-based, are available for these purposes and were demonstrated at the Round Table. However, more multi-stakeholder discussion would be required on user requirements and whether or not the public and private agents currently requiring various levels of traceability (specificity) would be prepared to give up their own systems in favour of an integrated multi-purpose system. There was scant discussion on these issues at the Round Table. Further inquiry would be useful. Integrated traceability is part of the current FAO work programme.

Figure II.2. **Traceability drivers in the food sector**



Source: Petter Olsen, "Traceability: Definitions, Drivers and Standards", NOFIMA.

Certifiers: Quality, consistency and capacity

Producers have complained that the ride towards certification is easier for some than others as a result of different certifiers applying standards in a more or less rigorous fashion. This applies to fisheries in different countries, or even different operators in the same fishery seeking certification to the same eco-labelling scheme. MSC argues that better standardisation of assessment decision trees is helping achieve greater consistency; they have undertaken work to improve consistency and to reduce the scope for certifier "interpretation." The clarity of the standard itself is also crucial. Certifiers present at the Round Table stressed the importance of the quality of the standard and also suggested that over time consistency would improve as certifiers become more familiar with applying any given standard.

Poor quality certifiers also appear to be an issue, as is an apparent shortage of certifiers is some jurisdictions. Because certification of certifiers is the responsibility of independent accreditation bodies, the standard owner does not have much, if any, control over who actually carries out audits against their standard. It was asked: "Who audits the auditors?" International standards for auditing and accreditation should apply. As the demand for certification grows the pool of auditors will need to expand. The range of certification schemes – not only eco-labels but also private safety/quality standards and those applying to aquaculture – will put increasing pressure on existing capacity. Will the market provide or is some specific capacity building required? Should governments take some initiative on this front? These questions also require more discussion.

II.7. The way forward: Areas for attention

The Round Table provided a unique venue for the various stakeholders in the eco-labelling phenomenon to share their particular perspectives and motivations. The dialogue proved to be rich and should continue at both the national and international levels. The Round Table clarified points of tension and key areas where further debate and action is required, in particular:

- Defining a workable and fair system for the distribution of the costs of certification. Each government will have to decide the boundaries of its own financial engagement in eco-labelling. Avenues for sharing experiences would help to expose the consequences of the various approaches and levels of engagement, and would help to clarify the respective roles of the public and private sectors in relation to eco-labels and certification.
- How eco-labels, and governments' responses to them, impact on market access and international trade requires further debate and empirical evidence. Clarifying the status of market mechanisms in relation to WTO mechanisms, and whether funding certification amounts to a subsidy, requires further research. International organisations, OECD, FAO, and WTO, all have a role to play in facilitating international dialogue and agreement.
- Strategies for incentivising transitional fisheries need to be developed. This includes some mechanism to reward positive change in fisheries working towards improved management, and to recognise good practice in fisheries that demonstrate responsible behaviour, some of which will not be ideal candidates for certification to an eco-label. Eco-labels provide a "burden of proof" for top performers; it is important that other fisheries are not left behind. In particular, given their importance in international fish trade, developing countries need to be included in strategies to improve fisheries management and sustainability; appropriate assessment methodologies and incentive formulae need to be developed.
- Calls for benchmarking eco-labelling schemes should not be ignored. At the very least a methodology for assessing any eco-labelling scheme against the *FAO Guidelines for the Eco-Labelling of Fish and Fishery Products from Marine Capture Fisheries* would give fishing operators, governments and buyers a tool to evaluate the credence of any existing or future eco-labelling scheme. There was some agreement that FAO was best placed to take this work forward.
- Gaps in the framework for global governance of fisheries sustainability need to be closed. Missing pieces of the governance puzzle were identified including standards for fisheries management and an agreed and shared definition of "sustainable fisheries". The development of a theoretical or aspirational governance regime for sustainable fisheries management could be considered. It would serve as a self-assessment tool for governments wishing to test their own fisheries management performance. The OECD and the FAO could work together to develop an approach to this work.

The Round Table confirmed that the various stakeholders in the fisheries supply chain all have an interest in and are committed to fisheries sustainability. There was overall consensus that eco-labels have a role to play in incentivising better fisheries management. The challenge now is to ensure that the pressure and momentum generated by that market-based instrument can be harnessed to complement public measures for sustainable and responsible fisheries management. This means aligning the various incentives so that the private sector, NGOs and governments, both at the national level and internationally, can work together towards the mutual goal of sustainable fisheries

management. Eco-labels provide a nexus between marketing and management and are an increasingly important part of the fisheries sustainability equation.

Notes

1. Alfons Schmid is an independent consultant and John Connelly is president of the National Fisheries Institute, United States. The Chairs' Summary Report is based on a report prepared by Sally Washington, consultant.
2. Eco-labelling: Product labelling conveying primarily environmental information to buyers; usually associated with a certification process.
3. Certification: A procedure by which a party gives written assurance that a product, process or service is in conformity with a standard. The procedure can be carried out as first, second or third party certification.
4. Sustainability: In its original sense, sustainability refers to development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Brundlandt, 1987). Applied to fisheries and aquaculture, the focus is on protecting the resource itself (fish stocks) and avoiding negative impacts on the surrounding eco-system.
5. Nielsen *Global Online Survey*, March 2009, of 25 420 consumers in 50 countries.
6. Presentation by Peter Hajipieris, "Recent Developments in the Branding and Marketing of Fish and Fish Products", *Birds Eye Iglo*.
7. *Ibid*.
8. Presentation by Jonathan Banks, "The Consumer's Perspective", AC Nielsen.
9. Based on the presentation by Peter Hajipieris, "Recent Developments in the Branding and Marketing of Fish and Fish Products", *Birds Eye Iglo*.
10. Eighty per cent of FOS certified products – 8 million metric tonnes of its 10 million metric tonnes – comes solely from Peruvian anchovies.
11. France, Iceland and the European Union all gave presentations at the Round Table. Information on Canada and the United States came from comments during discussion, while the situation in the Netherlands was communicated in the Minister's opening address and closing comments by the Dutch representative.
12. The results of this feasibility study are available (in French) online at: *www.ofimer.fr/Pages/Ofimer/Publications.html*.
13. Presentation by Peter Hajipieris, "Recent Developments in the Branding and Marketing of Fish and Fish Products", *Birds Eye Iglo*.
14. Presentation by Lahsen Ababouch, *Public and Private Safety/Quality Objectives and Principles,* FAO.
15. Rupert Howes, Chief Executive, MSC.
16. Since the Round Table, WWF has initiated a process to benchmark eco-labelling schemes.
17. FAO (2009), *State of World Fisheries and Aquaculture*, 2008, Rome.
18. Presentation by Dr Stefan Bergleiter, *Certified Sustainable Artisanal Fishery; First Experiences from the Pilot Project with Nile Perch Fishery in Tanzania*.

PART III

Country Notes

PART III

Chapter 1

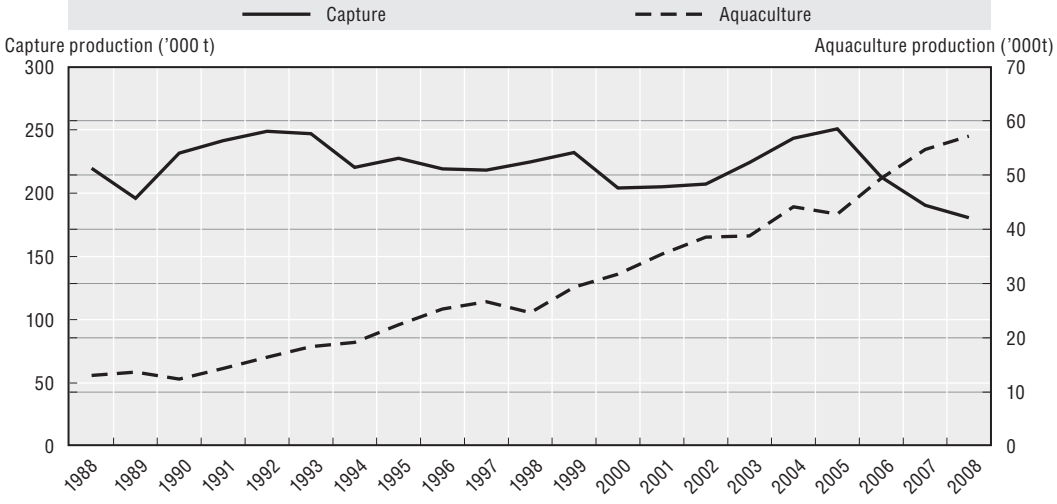
Australia

Australia

Summary of recent developments

- There has been steady reduction in Australian exports of fisheries products by value and volume, whereas imports of fishery products have increased, which has made Australia a net importer of fisheries products.
- The volume and value of production in Australian fisheries have been negatively affected in recent years by rising fuel prices, the appreciation of the Australian dollar, and increased competition in the domestic market from rising imports. In the 2008-09 financial year, the total volume of fisheries production fell by 1% while the gross value of Australian fisheries production increased slightly from the previous year to AUD 2 billion.
- The Australian Fisheries Management Authority (AFMA) has implemented explicit harvest strategies for Australian Commonwealth fisheries (the Commonwealth Fisheries Harvest Strategy Policy (HSP) to provide for more transparent and effective management.
- The Australian Government has continued its strong action against illegal, unreported and unregulated (IUU) fishing, which has resulted in a dramatic reduction in IUU fishing activity. The Cooperative Fisheries Enforcement Treaty against IUU between the governments of Australia and France came into force on 7 January 2011.
- Australia signed the Southern Indian Ocean Fisheries Agreement on 29 December 2006 and the Convention on the Conservation and Management of High Seas Fishery Resources of the South Pacific Ocean on 16 December 2010 and is working towards ratification of both treaties.

Harvesting and aquaculture production (tonnes)



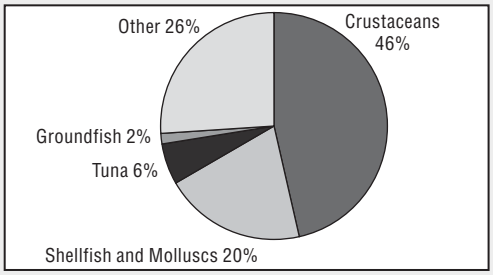
* The 2008 figures used in this graph were sourced from figures provided to the United Nations Food and Agricultural Organisation and have since been revised. Please refer to *Production Facilities, Values and Volumes* within the body of Australia's Country Note for revised production figures for the 2008-09 financial year.

Source: FAO FishStat Database.

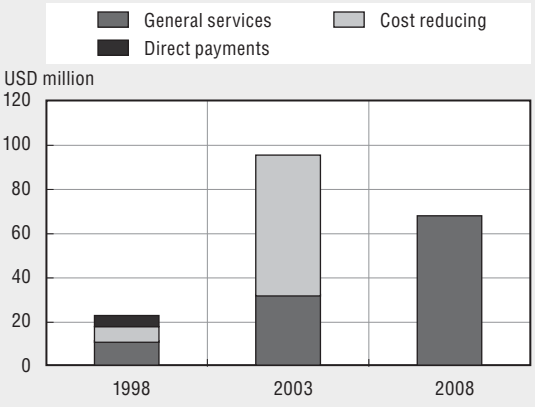
Key characteristics of the sector

- While the total volume of fisheries production slightly decreased over the recent years, the total value of the fisheries production remained relatively stable. The most important species landed in 2008 in terms of value were crustaceans (46%), followed by shellfish and molluscs (20%), tuna (6%) and groundfish (2%).
- A total of USD 67.46 million was transferred to the Australia's fisheries sector in 2008, which is a 29.4% decrease compared to the 2003 figures (USD 95.56 million). But these values should be taken as indicative of Commonwealth Government only contributions to management costs and fisheries research and development costs.
- Australia has become a net importer of fish products by value from 2007, and the discrepancy between import and export became larger in 2008. Reduced volumes of major edible export species has led to a steady reduction in the value of Australian exports of fisheries products, whereas imports of fishery products into Australia have increased in volume and value. Hong Kong and Japan are the main export markets and Thailand, New Zealand, China and Viet Nam are the main sources of edible fisheries import.
- Since 2000, the number of fishers dropped substantially (51.8%), whereas the number of fish farmers slightly increased (7.8%).

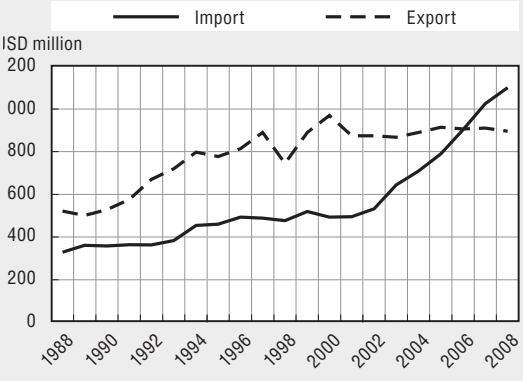
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	9 553	4 606	–51.8
Number of fish farmers	4 281	4 616	7.8
Total number of vessels	n.a.	332	n.a.
Total tonnage of the fleet	n.a.	48 828	n.a.

Legal and institutional framework

Management responsibility for Australian fisheries is divided between the Australian Commonwealth and the states and the Northern Territory and, in some cases, responsibility is shared. The *Offshore Constitutional Settlement 198 (*OCS) is the jurisdictional arrangement between the Commonwealth and states/Northern Territory that sets out responsibilities for offshore activities, such as fisheries, mining, shipping, navigation and crimes at sea.

The OCS provides for state and Northern Territory fisheries laws to apply inside three nautical miles and for Commonwealth fisheries laws to apply from three to 200 nautical miles. However, Commonwealth and the Northern Territory fisheries legislation allow alternative arrangements to be made for a fishery that override the existing jurisdictional lines set out by the OCS. Such arrangements, known as OCS fisheries arrangements, are intended to provide a more efficient and cost-effective management structure as Australian fisheries and fish stocks do not necessarily align with legal jurisdictional boundaries.

The Australian Fisheries Management Authority (AFMA) manages fisheries under Commonwealth jurisdiction in accordance with the provisions of the *Fisheries Management Act 1991* and the *Fisheries Administration Act 1991*. Principal management instruments are input controls such as limited entry; seasonal and area closures; restricting the number of fishing vessels; and gear restrictions. Output controls, such as individual transferable quotas (ITQs) as part of a total allowable catch (TAC), are also used and the major Commonwealth fisheries have ITQs or are moving to this form of management.

AFMA places emphasis on a partnership approach between fisheries managers, industry, scientists, fishing operators, environmentalists/conservationists, recreational fishers and the general public. Implementation of the partnership approach is facilitated by fishery-specific management advisory committees and resource assessment groups. Management advisory committees provide advice to AFMA on a variety of issues including fisheries management arrangements, research, compliance and management costs.

Management advisory committees (MACs) draw upon advice provided by resource assessment groups (RAGs), which have been established for each major fishery group or individual species. The RAGs also provide reports directly to the AFMA Commission on the state of fishery resources. In 2010, there were ten RAGs established to assess fisheries.

The Australian Government initiated processes to implement trial co-management arrangements for domestic fisheries in 2006. Co-management creates a partnership to achieve a shared responsibility for the management of the resource within a rigorous framework of accountability and policy guidelines. Within a co-management arrangement, responsibilities and obligations for sustainable fisheries management are negotiated, shared and delegated between government, fishers and other interest groups.

Three trials were established to identify the most effective co-management approach for Commonwealth fisheries. The preliminary outcomes of these trials were positive and indicate that co-management can improve industry-management relationships, increase cost effectiveness and deliver more efficient fisheries management. The trials also indicate that the fishing industry, given the right incentives, is a willing collaborator and can deliver stewardship over Australia's fisheries resources.

The Torres Strait fisheries are managed under the *Torres Strait Treaty 1978*, an arrangement between Australia and Papua New Guinea, whose primary purpose is to protect the traditional way-of-life and livelihood of Indigenous inhabitants of both nations.

The Australian jurisdiction is managed by the Torres Strait Protected Zone Joint Authority (PZJA), established under the *Torres Strait Fisheries Act 1984*. There are two PZJA management advisory committees, for prawns and for other fisheries.

Capture fisheries

Policy changes

In December 2005, the Australian Government Minister for Fisheries, Forestry and Conservation issued a formal Ministerial Direction to AFMA to implement a range of measures to end overfishing, limit the risk of future overfishing and manage the broader environmental impacts of fishing.

Ongoing work to achieve the objectives outlined in the Ministerial Direction includes:

- Implementing the **Commonwealth Fisheries Harvest Strategy Policy**, released in 2007. All major Commonwealth fisheries have implemented harvest strategies that aim to ensure an evidence-based precautionary approach to secure the ecological and economic sustainability of Commonwealth fisheries resources.
- Undertaking independent reviews to determine the suitability of ITQs for various Commonwealth fisheries, and moving to ITQs in all major fisheries.
- Moving towards ecological based fisheries management to address the broader environmental impacts of fishing, including minimising interactions with threatened or otherwise protected species, and to reduce bycatch and discarding in Commonwealth fisheries.
- Enhancing monitoring of fishing activity by requiring all fishing vessels operating in Commonwealth fisheries to have a vessel monitoring system fitted and operational since July 2007. And
- Establishing fishery-independent surveys in various Commonwealth fisheries to increase the transparency and integrity of fishery-dependent catch and effort information.

Performance

The real value of Australian fisheries has declined at an average annual rate of 3.8% since the start of this decade reaching AUD 2.2 billion in the 2008-09 financial year. Most of this fall is attributed to declines in the value of fisheries production in Commonwealth, state and the Northern Territory's wild catch fisheries which decreased at an average annual rate of 5.8% and 5.3% respectively from 1999-2000 to 2008-09. In recent years, growth in the real value of aquaculture has moderated the overall decline in the real value of fisheries production. Since 2004-05, the real value of aquaculture production grew at an average annual rate of 4.1%, reaching AUD 867 million in 2008-09.

Over the three years to 2008-09, rock lobster and prawns remained the highest value wild catch production for the Australian fisheries contributing 46% of the gross value of wild catch production.

In 2008-09, the real value of production of the Commonwealth fisheries increased by 5% to AUD 314 million, contributing 14% of the gross value of the total fisheries production. The Southern and Eastern Scalefish and Shark Fishery generated the highest value of all Commonwealth fisheries, with a gross value of AUD 95.5 million in 2008-09. The Northern Prawn Fishery continued to be the most valuable single method Commonwealth managed fishery, with a value of AUD 74.0 million in 2008-09.

The Labour Force Survey by the Australian Bureau of Statistics (ABS) estimates that commercial fishing employment fell to 9 222 jobs in 2008-09, lower than at any time in the past two decades.

According to the 2006 ABS population census, 9 736 people were directly employed in commercial fishing and aquaculture from a workforce of around 9.1 million in 2006. A further 6 203 people worked in wholesaling and processing of fisheries products.

Table 1.1. **Employment in the Australian fishing industry (August 2006)**

Species	Employment	% of total
Aquaculture	3 628	37.3
Finfish trawling	278	2.9
Line fishing	86	0.9
Prawn fishing	648	6.7
Rock lobster fishing	1 154	11.9
Other fishing	3 942	40.5
Total	**9 736**	**100.2**[1]
Fish wholesaling	4 202	67.7
Seafood processing	2 001	32.3
Total (processing)	6 203	100.0

1. > 100% due to rounding.

Table 1.2. **Estimated employment in the Australian fishing industry (August 2006)**

	Wild catch[1]	Aquaculture	Wholesaling and processing
New South Wales	1 106	709	1 242
Victoria	514	280	1 118
Queensland	1 460	551	1 310
Western Australia	1 152	325	809
South Australia	1 003	766	969
Tasmania	643	935	680
Northern Territory	222	62	58
Australian Capital Territory	7	0	17
Total	**6 108**	**3 628**	**6 203**

1. Includes other fishing, hunting and trapping.

Status of fish stocks

In the Commonwealth fisheries, a total of 101 target species or stocks were available for evaluation in 2009 compared to 74 in 2004. Of those 101 Commonwealth stocks available for assessment in 2009 (compared to 2004), the number of stocks assessed as not overfished increased from 20 to 59; the number of stocks assessed as overfished declined from 14 to 12; the number of stocks assessed as uncertain if overfished declined from 40 to 30; the number of stocks assessed as not subject to overfishing has increased from 12 to 73; the number of stocks assessed as subject to overfishing increased from 9 to 10; and the number of stocks assessed as uncertain if subject to overfishing decreased from 53 to 18.

The number of stocks classified as uncertain increased, almost continuously, since 1992, peaking at 52 in 2007. Much of the historical increase was a consequence of the addition of

new stocks not previously considered as insufficient information was available. Since 2009, the Australian Government has invested in research to reduce uncertainty in stock status and this is reflected in the reduction in the number of uncertain stocks shown above.

Like most countries, Australia faces numerous challenges in managing its fisheries resources. The overfished condition of some fish stocks and the uncertain classification of several others continue to be matters for concern.

AFMA has also implemented management measures intended to rebuild overfished stocks. The risk of fishing to the status of other Commonwealth fish species caught incidentally to target species has been identified through an ecological risk assessment (ERA) framework.

A management handbook, *Chondrichthyan Guide for Fisheries Managers* (2009), has been produced to assist in the development of management measures for high risk sharks, skates and rays. AFMA has also introduced bycatch and discard work plans to reduce bycatch of all high risk species, as well as the total amount of unwanted bycatch.

Species listed as threatened under Australian environmental law – the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – are afforded additional protection. Fishery management plans may only be accredited under the EPBC Act if they are found not to, or not likely to, adversely affect the survival or recovery in nature of a listed threatened species.

Management of commercial fisheries

Management instruments for fisheries under Australian government jurisdiction are outlined in Annex 1.A1.

The Australian Government has provisions under the *Fisheries Management Act 1991* for granting foreign fishing licences for commercial fishing in a specified area of the Australian Fishing Zone or a specified fishery, and allowing Australian vessels to fish on the high seas.

Management of recreational fisheries

Recreational fishing is defined as fishing that is not for commercial purposes excluding traditional Indigenous fishing. The day-to-day management of recreational fishing is for the most part undertaken by the state and territory governments and includes a range of measures including licensing frameworks, controls on types and amounts of fishing gear that may be used and seasonal and/or area closures.

Aboriginal and Torres Strait Islander fisheries

Torres Strait fisheries are managed in accordance with the *Torres Strait Treaty* made between Australia and Papua New Guinea. It aims to protect the traditional way-of-life and livelihood of traditional inhabitants of the waters between Australia and Papua New Guinea in line with the *Torres Strait Fisheries Act 1984*. Since 1989, all non-Indigenous participation in Torres Strait fisheries has been capped to reserve further expansion for traditional inhabitant commercial fishing.

Looking to the Future: A Review of Commonwealth Fisheries Policy was published in 2003 to ensure that traditional Indigenous fishing is effectively incorporated into Commonwealth fisheries management. Recent examples are the reallocation processes in the Torres Strait Finfish and Tropical Rock Lobster fisheries for increased access entitlements for Indigenous people. Fishing is an important source of food and income for Indigenous

people because a relatively high proportion of the Indigenous people live on the riparian systems and along the coastline.

Monitoring and enforcement

AFMA administers compliance programmes directed at both domestic and foreign fishing vessels. The Commonwealth has flag state responsibilities for fishing by Australian vessels on the high seas.

In all Commonwealth fisheries, mandatory vessel monitoring systems are used to provide real-time position reporting of vessels and movements in and out of port.

Illegal foreign fishing in Australia's northern waters continues to occur although the number of incursions has dramatically reduced since peaking in 2006. Deterrence strategies including strong at-sea enforcement measures such as loss of catch, fishing gear and fishing vessels and targeting the source of illegal fishing in-country through education and capacity building programmes has proven effective.

Efforts to deter illegal foreign fishing in southern ocean waters have also proven successful, with AFMA involved in patrols provided by the Customs and Border Protection Service. Fisheries officers also continued to participate in joint patrols of the Southern Ocean with officers embarking on French navy warships. No illegal activity has been detected inside Australia's Exclusive Economic Zone surrounding Heard Island and McDonald Islands since 2004.

Fisheries monitoring and enforcement is also conducted by state/territory fisheries agencies.

Australia has also developed a National Fisheries Compliance Strategy 2010-15 that outlines the objectives that Australian fisheries agencies will pursue to promote voluntary compliance and create effective deterrence to illegal fishing activities. At the centre of the strategy is the need to achieve collective responsibility and action among major stakeholder groups (commercial, recreational and Indigenous fishing sectors) and the community.

Illegal, unreported and unregulated fishing

Australia remains concerned about the effects of IUU fishing on world fish stocks and the marine environment. Australia has taken a strong stance on the issue through a broad international strategy.

Australia has maintained its maritime surveillance activities in response to key maritime threats. The surveillance and enforcement programme has proven to be an effective deterrent against illegal fishers.

Australia's main enforcement power over illegal foreign fishers is through application of the *Fisheries Legislation Amendment Act 2008*. Recent amendments give stronger powers to border protection officers to apprehend ships involved in illegal fishing and create new offences for Australian citizens if involved in illegal fishing overseas.

Australia is actively contributing to various international efforts on IUU fishing.

IUU fishing in Australia's northern waters

Australia is actively working with its northern neighbours to reduce IUU fishing and improve fisheries management in the South East Asia region.

Significant progress has been made in reducing illegal foreign fishing activity in the region. Between 2005-06 and 2009-10, apprehensions of illegal fishing vessels declined by 94%. This reduction was due largely to Australian Government "on-the-water" measures.

In 2007, Australia and Indonesia developed the Regional Plan of Action to Promote Responsible Fishing Practices including Combating Illegal, Unreported and Unregulated Fishing (RPOA). The RPOA was agreed by Australia, Indonesia and nine other South-East Asian countries.

Multilateral agreements and arrangements

Australia is a member and active participant of a number of regional fisheries management organisations and continues to strengthen its cooperative maritime relationships in the Pacific, Antarctic and Indian Ocean regions.

Australia aims to ensure regional fisheries management organisations are equipped to maintain or recover highly migratory and other fish stocks at levels that provide for the long-term conservation and sustainable use of these resources.

Australia is currently participating in negotiations to develop a cooperative maritime enforcement and information sharing agreement in the Pacific region. This agreement would sit as a subsidiary agreement under the *Niue Treaty on Cooperation in Fisheries Surveillance and Law Enforcement in the South Pacific Region*.

The Cooperative Fisheries Enforcement Treaty between Australia and France came into force January 2011. The treaty formalises cooperative enforcement arrangements against IUU fishing vessels undertaken by joint patrols of the French and Australian Southern Ocean exclusive economic zones and territorial seas.

Australia is also an active participant in the World Trade Organisation (WTO) fisheries subsidies rules negotiations. Australia submitted an ambitious textual proposal to the WTO membership in 2010.

Aquaculture

Policy changes

The management and regulation of aquaculture on a daily basis is primarily a state government responsibility. However, the Australian Government has a role in the coordination of policy over national issues such as quarantine, disease outbreak controls, product quality, labelling, trade and taxation.

Since 1999, the Australian Government has been actively involved in encouraging and supporting aquaculture and implemented the *Aquaculture Industry Action Agenda* (AIAA) in 2003 which included ten strategic initiatives.

Indigenous aquaculture

The Department of Agriculture, Fisheries and Forestry (DAFF) and the former Aboriginal and Torres Strait Islander Commission jointly established DAFF's Indigenous Aquaculture Unit (IAU) in 2003. The IAU promotes Indigenous aquaculture development, provides realistic advice, coordinates funding applications and provides scientific, technological, and economic guidance on projects, as well as cultural understanding on key issues.

The key programme which the IAU implements is the *Indigenous Aquaculture Strategy* (the Strategy) which aims to deliver important outcomes through sustainable projects.

Under the Strategy, the IAU implements projects that provide opportunities for Indigenous involvement in the expansion of aquaculture. The goal is to help improve the economic and social circumstances of Indigenous people through the establishment of sustainable rural industries.

Production facilities, values and volumes

The volume of seafood production in 2008-09 was 237 485 tonnes, down from 244 312 tonnes in 2006-07. However, the value of seafood production remained largely the same at AUD 2.2 billion.

The volume of aquaculture production in 2008-09 was 70 092 tonnes, which is a 15% increase since 2006-07. The share in volume of aquaculture in the total seafood production continues to grow from 25% in 2006-07 to 30% in 2008-09. The rise in value of aquaculture in percentage terms (36% in 2006-07 to 39% in 2008-09) indicates that the aquaculture sector will provide the major impetus for medium to long-term growth in the value of seafood production.

The gross value of aquaculture production in 2008-09 was AUD 867 million, with the three most valuable aquaculture species being salmonids, farmed tuna and edible oysters. Together they accounted for 76% of total aquaculture production volume and 67% of the total production value.

Fisheries and the environment

Environmental policy changes

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act was enacted in 2000. Under the Act, Commonwealth managed fisheries are subject to strategic environmental assessments, which assess the impacts of fishing on the marine environment. All Commonwealth and state-managed fisheries with an export component must be assessed under the Act to enable the export of product harvested. The management arrangements for each fishery are assessed against the *Guidelines for the Ecologically Sustainable Management of Fisheries* (2nd edition).

The management arrangements of fisheries in Commonwealth waters are also assessed for potential impacts on species listed under the EPBC Act. To gain accreditation under the EPBC Act, a specified plan or management regime must require that persons engaged in fishing take all reasonable steps to ensure that members of species listed under the Act are not killed or injured as a result of fishing, and that the fishery is not likely to adversely affect the survival or recovery in nature of a listed threatened species, or the conservation status of a cetacean, a listed migratory or a listed marine species. The resulting accreditation allows fishers to operate under the accredited management arrangements to fish in Commonwealth waters without requiring a permit.

In October 2008, the Minister for the Environment, Heritage and the Arts commissioned an independent review of the EPBC Act. The review assessed the operation of the EPBC Act and the extent to which its objects have been achieved. The final report was publicly released in December 2009.

Marine bioregional planning

Commitment to a national system of marine protected areas (MPAs) was made in the *Australia's Ocean Policy* in 1998. This intention was reflected in Australia's agreement to the

2002 *Convention on Biological Diversity*. In 2005, the government brought its programme of regional marine planning, known as marine bioregional plans, directly under the EPBC Act. The plans identify the conservation priorities in Commonwealth waters (3-200 nm), as well as measures to conserve marine protected areas.

The aim of marine bioregional planning is to implement an ecosystems based management approach to conserve Australia's unique marine environment. The first Marine bioregional plan was developed for the South-east and resulted in the South-east marine protected area being declared in 2007. Marine bioregional planning is currently being implemented in four marine bioregional planning regions: South-west, North-west, North and East Marine Regions. Bioregional plans in all regions are scheduled to be completed in 2012.

National representative system of marine protected areas

The development of a National Representative System of Marine Protected Areas (NRSMPA) is a key commitment by the Australian, state and territory governments for biodiversity conservation in the marine environment. The aim is to establish a national system of MPAs that contain a comprehensive and representative sample of Australia's marine ecosystems. There are over 200 MPAs in Australian Waters, equating to a total NRSMPA estate covering approximately 88 million hectares or 10% of Australia's EEZ (excluding the Australian Antarctic Territory).

In the Great Barrier Reef Marine Park, established since 1975, over 30% of the multiple use zones are strict nature reserves (IUCN Category 1a).

Incidental catch of seabirds in longline fisheries

A *Threat Abatement Plan for the Incidental Catch (or Bycatch) of Seabirds during Oceanic Longline Fishing Operations* (TAP) was first released in 1998 and revised in 2006. The TAP was developed under the EPBC Act, following the listing of "incidental catch (or bycatch) of seabirds during oceanic longline fishing operations" as a Key Threatening Process under the Act.

In mid-2000, Australia initiated the negotiation of a multilateral agreement to conserve seabirds under the *Convention on the Conservation of Migratory Species of Wild Animals*. The *Agreement on the Conservation of Albatrosses and Petrels* was opened for signature in 2001. To date there are 13 signatories.

In 2003, the Australian Government released a report entitled *Seabird Interactions with Longline Fisheries in the Australian Fishing Zone*. A further review entitled *2008 National Assessment Report for Reducing the Incidental Catch of Seabirds in Longline Fisheries* was released in 2010.

Bycatch Action Plans (BAPs)

The *Commonwealth Policy on Fisheries Bycatch* was launched in 2000 with a commitment to develop Bycatch Action Plans (BAPs). All Commonwealth-managed fisheries have had BAPs approved by the AFMA Board. Each BAP has been developed in line with the *Fisheries Management Act 1991* to ensure that the unique biological, social and economic nature of each fishery is recognised. In 2008, AFMA released the *Programme for Addressing Bycatch and Discarding in Commonwealth Fisheries: an Implementation Strategy*. The programme develops fishery specific work plans which focus on "high risk" bycatch and Threatened, Endangered and Protected species as identified via the Ecological Risk Assessment process in accordance with this Implementation Strategy. These work plans have replaced the BAPs.

National Plan of Action for the Conservation and Management of Sharks

Australia's *National Plan of Action for the Conservation and Management of Sharks* (2004 Shark-plan) was developed in response to the corresponding International Plan of Action by the FAO. The plan is currently under review and the review is expected to be completed by May 2011. An updated National Shark Assessment Report was released in March 2010 in accordance with the International Plan of Action. The practice of shark finning, where the fins are removed and the trunk of the shark is discarded at sea, is not permitted in fisheries managed by the Australian Government. Similar measures are in place in fisheries managed by the states and Northern Territory.

National Strategy to Address Interactions between Humans and Seals

The draft *National Strategy to Address Interactions between Humans and Seals: Fisheries, Aquaculture and Tourism* was released in 2006 to mitigate adverse impacts of the fisheries, aquaculture and tourism sectors on seal and sea lion populations. AFMA implemented an Australian sea lion management strategy in 2010 to reduce sea lion interactions within the Southern and Eastern Scalefish and Shark Fishery to a level that will ensure the recovery of the Australian sea lion population.

Threat Abatement Plan for Injury and Fatality to Vertebrate Marine Life Caused by Ingestion of, or Entanglement in, Harmful Marine Debris

A Key Threatening Process listed under the EPBC Act is "Injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris". A TAP has been developed to address the threat. This TAP aims to provide a coordinated national approach to the implementation of measures to prevent and mitigate the impacts of harmful marine debris. It will also guide Australia's efforts in international forums to build and strengthen collaboration to identify the origins of, and effective responses to, marine debris on a regional and international level. The TAP was released in 2009.

Australian government financial transfers

Transfer policies

Table 1.3 shows the estimates of government financial transfers to the fishing industry in 2009-10.

Structural adjustment

Australian Government policy is that adjustment assistance is not preferred where fishing effort has been or should be removed from a fishery through normal management action to meet fisheries management objectives. Adjustment assistance is only used in special circumstances to facilitate the introduction of new fisheries management arrangements.

Where MPAs/zones create additional requirements for fishing effort reduction beyond that required for achieving fisheries management objectives, Australian government-funded adjustment assistance may be considered on a case-by-case basis to support the reduction in fishing effort.

Table 1.3. **Australian Government Transfers to Commercial Fishing 2009-10**

			2009-10 AUD million
Market price support			n.a.
Direct payments			n.a.
General services[1] (management costs)	AFMA	Domestic fisheries compliance	7.04
		Foreign fisheries compliance	19.57
		Research and data	4.90
		Licensing and revenue collection	0.17
	FRDC[2]		16.00
Cost recovery from industry (collected by AFMA)[3, 4]			12.94

1. Total should be taken as indicative of the Australian Government only contributions to management costs (through AFMA) and fisheries R&D by the Fisheries Research and Development Corporation (FRDC).
2. See Annual report for more detail: *www.daff.gov.au/publications/fisheries*.
3. All values include overhead cost allocations, but these are based on estimates of appropriate cost allocation principles based on AFMA's Cost Recovery Impact Statement. Specific calculation and attribution of these costs has not been undertaken for the purposes of this report.
4. Cost recovery from industry excludes amounts representing adjustments for prior period over or under recoveries.

Source: AFMA, FRDC and annual reports.

Post-harvesting policies and practices

Food safety

There are general requirements in the *Australia New Zealand Food Standards Code* (the Food Standards Code) that all foods offered for sale should be safe for human consumption. In 2005, the Food Safety Australia New Zealand (FSANZ) Board approved the *Final Assessment Report for the Primary Production and Processing Standard for Seafood*. This report contains a scientific evaluation of risk within the seafood industry and management options to minimise this risk. It proposed applying basic food safety requirements to the seafood industry and documented food safety management systems to the highest risk sector of the industry, including seafood businesses that handle oysters and other bivalves.

In 2005, Standard 4.2.1 – *Primary Production and Processing Standard for Seafood* – became part of the *Australia New ZealandFood Standards Code*. Seafood businesses are now required to comply with it. To help with interpreting Standard 4.2.1, FSANZ developed the *Safe Seafood Australia* guide.

Food labelling

Enforcement of food labelling requirements is the responsibility of states and territories.

To assist and support this role, the Australian Government provides funds for the establishment, promotion and support of the Australian Seafood Consumer Hotline. The hotline is a free-to-call number service which provides a single point of contact for consumers to lodge complaints regarding mislabelled seafood. It also provides a means of raising awareness within the industry in relation to country of origin labelling and accurate labelling of fish names.

The hotline supports the Country of Origin Food Labelling (CoOL) requirements and applies to all seafood. The CoOL requirements allow consumers to be informed about the source of their seafood products.

Fish names standard

To address the mislabelling of seafood, a consortium of government and seafood industry representatives funded by the Fisheries Research and Development Corporation

has created the Australian Fish Names List (the Standard), which was formally endorsed as an Australian standard in 2007. The Standard is a list of the approved marketing names for commercial seafood species available in Australia, to ensure conformity of fish nomenclature throughout the seafood industry.

Processing and handling facilities

State and territory governments are responsible for all processing, handling and distribution facilities, and for the collection of information related to the seafood and aquaculture industries.

Markets and trade

Markets

The gross value of fisheries production in Australia for 2008-09 was AUD 2.2 billion. Total fisheries exports in 2008-09 were valued at AUD 1.5 billion, comprising of edible fisheries exports of AUD 1.1 billion, and non-edible fisheries exports of AUD 384 million. The total fisheries imports in 2008-09 were valued at AUD 1.7 billion. Around 75% of the fisheries imports (AUD 1.3 billion) were edible fisheries imports, whilst pearls made up the majority of the AUD 427 million of non-edible imports.

Trade

Exports

In 2008-09, Australia's total fisheries exports were valued at AUD 1.5 billion. The total value of Australian fisheries exports declined each year from 2000-01 to 2007-08, but saw a small (2%) increase in 2008-09 from the 2006-07 exports of AUD 1.49 billion.

In 2008-09, rock lobster continued to be the most valuable fisheries export, followed by pearls and abalone.

In 2008-09, around 75% of total exports were edible fisheries products such as rock lobster, tuna, abalone and prawns.

Hong Kong and Japan are the main export markets for Australian edible fisheries exports. In 2008-09, 48% of edible fisheries products were exported to Hong Kong and 28% were exported to Japan.

Imports

The total value of all seafood imports rose to AUD 1.7 billion in 2008-09, an increase of AUD 151 million over the 2007-08 imports. Of particular note was the increase in prawn imports from China and Viet Nam and in imports of frozen finfish fillets from Viet Nam.

In 2008-09, around 75% (AUD 1.3 billion) of the gross value of imports was edible fisheries products, with pearls accounting for the majority of non-edible imports.

Thailand, New Zealand, China and Viet Nam were the main sources of edible fisheries products imported. In 2008-09, imports from these four countries accounted for 70% of total edible imports by value.

Outlook

In recent years, the Australian fishing industry has undergone significant changes and encountered major challenges. The impact of a stronger Australian dollar has

encouraged imports and discouraged exports. Declining returns have placed pressure on many seafood operators. These circumstances have arisen despite a generally positive consumer attitude to seafood.

The Australian Government is meeting these challenges through a variety of initiatives with the aim to improving fisheries management and addressing the sustainability of fish stocks to ensure the long-term viability of the Australian fishing industry.

Under the 2002 World Summit on Sustainable Development Johannesburg Plan of Implementation, Australia is committed to the establishment of MPAs consistent with international law and based on scientific information, including representative networks, by 2012. The Australian Government remains committed to the development of a national system of MPAs and to achieving a substantial part of that network by 2012. More than 10% of Australia's marine jurisdiction is already within MPAs. A parallel process of marine bioregional planning will identify broader marine conservation priorities and actions to address particular threats and issues such as recovery of threatened marine species.

Australia is continuing with the development of a number of action plans to address and minimise the interactions between fishing operations and other high risk species such as sea lions, seals, sea birds and a range of sharks. The development of ecological risk assessments for Commonwealth fisheries will further ensure effective targeting of management action for high-risk species.

In addition, improved monitoring and compliance measures and increased surveillance measures to combat illegal, unreported and unregulated fishing, will ensure that Australia's efforts to ensure the sustainability of our fish stocks are not negatively impacted by non-compliant activities.

Another positive sign for fisheries in Australia has been the continued growth in aquaculture in recent years. Aquaculture now accounts for nearly 39% of Australia's gross value of fisheries production.

Farmed salmonids are a key production species in terms of both volume and value (AUD 325 million), as are tuna (AUD 158 million), and prawns (AUD 57 million).

Growth in the aquaculture sector may be attributed to the ongoing adoption of a wide range of innovative and sustainable farming practices, as well as increased marketing in existing and new overseas markets. The sector is expected to continue to grow in the future and is likely to provide the major impetus for medium to long-term growth in the value of Australia's seafood production.

Consumer demand for healthy and clean seafood remains an area that the Australian fishing industry is well placed to take advantage of. Australia's discerning consumer base is increasingly appreciating the benefits of eating seafood products and is increasingly willing to pay for the best quality food. There may be benefits for industry associated with enhancing the seafood product available through innovation and marketing. In addition, minimising the risk of adverse consumer experiences due to poor quality or mislabelling may have positive benefits for consumer demand for seafood.

ANNEX 1.A1

Management arrangements for Commonwealth managed fisheries (2009-10)

Fishery	Management arrangements	Changes since 2008-09
Northern Prawn Fishery	Input controls (limited entry, seasonal closures, permanent area closures, gear restrictions, catch limit triggers and bycatch limit triggers). Bycatch and Discards Work Plan applies.[1]	A management plan is being developed to introduce quota management into the fishery. The management plan is expected to be in place for 2012.
Southern Bluefin Tuna Fishery	Output controls (individual transferable quotas) managed under the Southern Bluefin Tuna Management Plan consistent with obligations under the Convention for the Conservation of Southern Bluefin Tuna. Bycatch and Discards Work Plan applies.	Australia's national allocation is 4 015 tonnes per year for 2010 and 2011 as agreed by the Commission for the Conservation of Southern Bluefin Tuna.
Southern and Eastern Scalefish and Shark Fishery – comprising Gillnet Hook and Trap, Commonwealth Trawl Sector and Great Australian Bight Trawl fisheries	Managed under the *Southern and Eastern Scalefish and Shark Fishery Management Plan 2003*. Key management arrangements include input controls (limited entry, individual transferable quotas, gear restrictions and area closures) and output controls (total allowable catches) which apply for 34 species or stocks of shark and finfish. Harvest Strategy Framework used to set total allowable catches for these species. Bycatch and Discards Work Plan applies.	Rebuilding strategies for School Shark, Eastern Gemfish and Blue Warehou implemented in 2008 to rebuild stocks within prescribed timeframes. New observer sampling regime implemented in 2010.
Eastern Tuna and Billfish	Input controls (limited entry with vessel size restrictions in some areas, gear restrictions and closures). Bycatch and Discards Work Plan applies. Fishery to move to total allowable catches allocated as individual transferable quotas under a new management plan on 1 March 2011. Met requirements of Threat Abatement Plan for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations.	Management Plan came into force in November 2005. Management Plan was fully implemented on 1 November 2009, following the conclusion to appeals on the basis for allocation of individual tradeable effort units. Observer coverage is approximately 8%. Revised line weighting regime to mitigate seabird interactions.
Bass Strait Central Zone Scallop	Input controls (limited entry, gear restrictions and closures). Output controls (total allowable catch/individual transferrable quotas). Bycatch and Discarding Workplan Plan applies. The fishery reopened in 2009.	A Management Plan was determined in September 2002, and individual transferable quotas were introduced. A zero total allowable catch was set over the entire fishery for the period 2006-08.
Torres Strait Protected Zone Joint Authority Fisheries	Input controls (limited entry on fully transferable licences, vessel size restrictions, size limits, gear restrictions, area closures, and seasonal closures) and output controls (possession limits, total allowable catches) on some other hand collection fisheries. Prawn fishery management plan was implemented in 2009.	A Finfish Management Plan is in development with planned implementation in 2012. Legislative amendments in progress will introduce a maximum legal size limit for *Plectropomus areolatus*, a net size restriction for traditional fishing and remove the limitation on holding live finfish. The Tropical Rock Lobster Fishery underwent a restructure in the 2007-08 financial year. Harvest strategies are being developed for the Torres Strait Prawn, Trochus and Beche de mer fisheries.
Sub Antarctic Fisheries (Macquarie Island; Heard Island and McDonald Islands)	All managed either under or consistent with Convention for Conservation of Antarctic Marine Living Resources (CCAMLR). Output controls with a total allowable catch and individual transferable quotas and input controls (limited entry, closures) applies.	Increased use of longlining to take toothfish quota over trawling. Longline trial started in the Macquarie Island Toothfish Fishery in 2007 for a period of four years.

Fishery	Management arrangements	Changes since 2008-09
Southern Squid Jig	Input controls (limited entry). Bycatch and Discards Work Plan applies.	A Management Plan came into effect from 1 January 2006 and introduced a total allowable effort. A trigger point for total catch was established to provide for a decision making process should catch levels significantly increase.
Western Tuna and Billfish Fishery	Input controls (limited entry, area restrictions). Individual transferrable quota management and total allowable commercial catches came into force on 1 July 2010. Bycatch and Discards Work Plan applies.	The *Western Tuna and Billfish Fishery Management Plan 2005* came into force in October 2005. The management plan implements quota management for the fishery. Allocation of statutory fishing rights occurred in May 2010.
Christmas Island and Cocos (Keeling) Islands	Trawl and aquarium fish input controls (limited entry, area restrictions) and output controls (total allowable catch). Fishing for tuna and tuna-like species in waters outside 12 nautical miles is covered by the Western Tuna and Billfish Fishery Management Plan 2005. Statutory fishing rights under the Management Plan are expected to be allocated in 2007.	In late 2002, the inshore waters (*i.e.* within 12 nautical miles) of the Christmas and Cocos (Keeling) islands were exempted from the application of the *Fisheries Management Act 1991*. Responsibility for managing these waters now lies with the Commonwealth Department of Infrastructure, Transport, Regional Development and Local Government. The Department of Infrastructure has entered into a service delivery arrangement with the Western Australian Department of Fisheries for the management of these inshore fisheries.
Coral Sea	Input controls (limited entry, spatial closures, size limits). Output controls (TACs for Sea Cucumber Sector, size restrictions, catch triggers). Other: prescribed observer coverage levels, move-on provisions.	Trip limits for certain deepwater shark species implemented.
Small Pelagic Fishery	Input controls (limited entry, geographic zones, trigger catch levels and total allowable catches applied in certain zones). Bycatch and Discards Work Plan applies. The 2009 Statutory Management Plan provides for the grant of individual transferable quotas and statutory fishing rights.	The *Small pelagic Fish Management Plan 2009* came into effect in November 2009.
Norfolk Island	Inshore fishery: Output controls; voluntary catch limits on Redthroat Emperor to align with spawning season (usually from December to January). A new management policy (the Norfolk Island Inshore Fishery Management Policy 2009) was developed by the Norfolk Island Government for the management of recreational and charter fishing in the NIIF. The AFMA Commission endorsed the management policy and entered into a memorandum of understanding with the Norfolk Island Government to maintain a monitoring and advisory role in the fishery. Offshore demersal finfish fishery: Exploratory fishing ceased on 31 December 2003.	AFMA commenced work on a policy to guide the development of a possible small-scale fishery in the area of the NIIF. Commercial fishing will be managed under the provisions of the *Fisheries Management Act 1991*.
North West Slope Trawl	Input controls (limited entry (7 permits with a 5 year duration), cod end mesh size restrictions), Harvest Strategy.	A revised harvest strategy for the Western Trawl Fisheries is to be implemented in 2011-12.
South Tasman Rise	Allocated total allowable catch for orange roughy (shared with New Zealand under a Memorandum of Understanding). Australia has input controls (limited entry, and compliance requirements).	The fishery has been closed to commercial fishing until further information is gathered on the current status of stocks (orange roughy and oreo dory).
Western Deepwater Trawl	Limited Entry (11 permits with a five-year duration) Harvest Strategy.	A revised harvest strategy for the Western Trawl Fisheries is to be implemented in 2011-12.

1. In fisheries where a bycatch of threatened or endangered species occurs, the Bycatch Action Plans (required for all Commonwealth managed fisheries) should protect these species adequately from the impact of fishing. For example, Northern Prawn Fishery vessels must now use turtle excluder devices and bycatch reduction devices.

Source: Australian Fisheries Management Authority.

PART III

Chapter 2

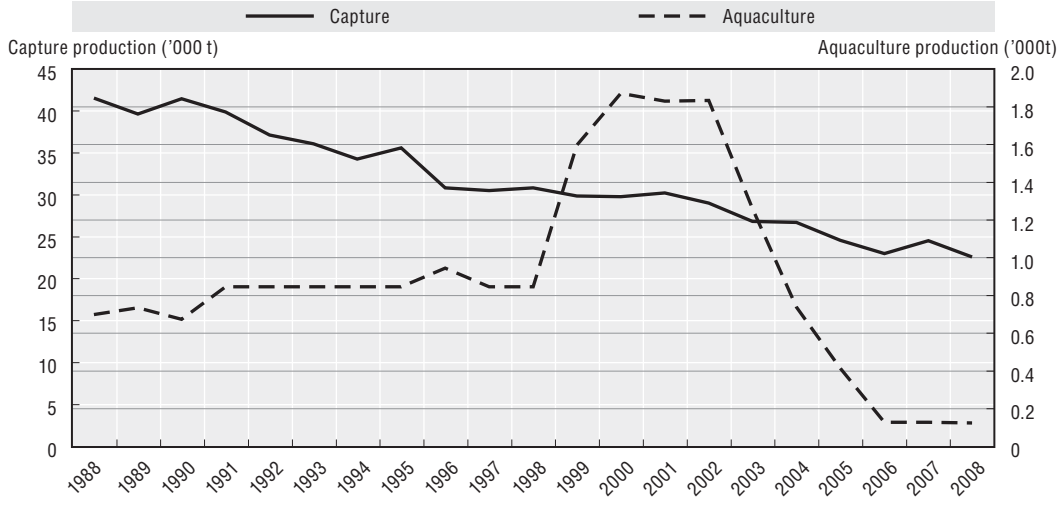
Belgium

Belgium

Summary of recent developments

- The total catch by Belgian vessels in 2008 decreased by 7% to 20 012 tonnes, compared to 21 577 tonnes in 2007. 86% of this volume was landed in Belgian ports. The average price paid in both Belgian and foreign ports was EUR 3.81/kg. The total value of the catch in both Belgian and foreign ports amounted to EUR 76.3 million (–15%). In 2009, landings decreased by 4% to 19 171 tonnes, compared to 2008. Of this amount, 80% was landed in Belgian ports (–6%). The prices for fishery products decreased to 3.56\EUR/kg. The total value of the catches decreased by 10% to EUR 68.3 million.
- In 2008, Belgium seafisheries, as other EU-fleets, were hampered by high fuel prices. Fuel prices in 2008 increased by 30% to a mean value of 0.63 EUR/l. High fuel prices combined with lower prices for fishery products put the Belgian fisheries into a deep crisis. In 2009, however, fuel prices followed the decreasing trend that was starting at the end of 2008, with average fuel prices of 0.41 EUR/l, a decrease of 35% compared to 2008.
- The Belgian fleet consists almost exclusively of demersal trawlers. In both 2008 and 2009, 90% (+4% compared to 2007) of the catches were demersal species. Amongst them, sole is economically the most important species.

Harvesting and aquaculture production (tonnes)

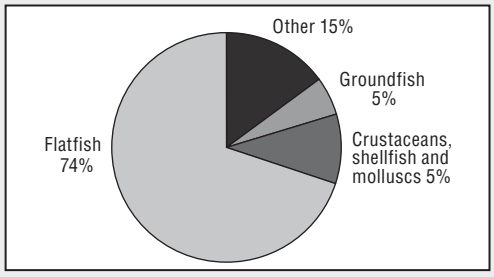


Source: FAO FishStat Database.

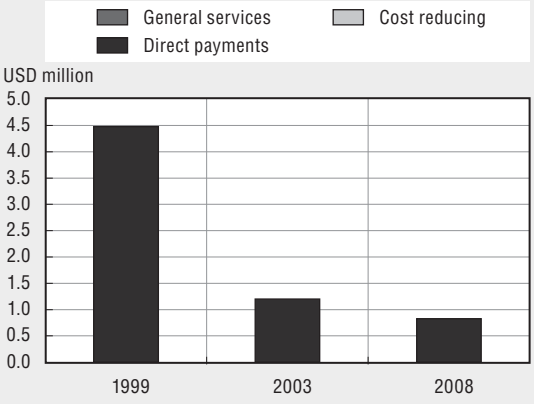
Key characteristics of the sector

- In 2008, landings of sole represented 48% of the value of all landings by Belgian vessels (–3%). In 2009, this percentage increased to 51% of the total value.
- In 2009, funds from the European Fisheries Fund were used for a Fleet Adaptation Scheme (FAS). Under this scheme, the equivalent of 20% of the fleet capacity in terms of kW and GT was scrapped. Furthermore, the fund promoted fuel-efficiency improvements.
- After a period of growth from 2000 on fish trade has slowed down during the last years. The trade balance remains largely negative for Belgium, with import values 17 times higher than domestic production.
- Flatfish like sole and plaice, but also cod and whiting remain however important export commodities for other European markets.
- The number of fishing vessels decreased from 102 at the start of 2008 to 100 vessels at the end of the year. Engine capacity from the withdrawn vessels was incorporated into the remaining fleet. In 2009, the number of fishing vessels decreased further. At the end of the year, there were 89 vessels with a total capacity of 51 590 kW (–5%) and 16 048 GT (–16%).

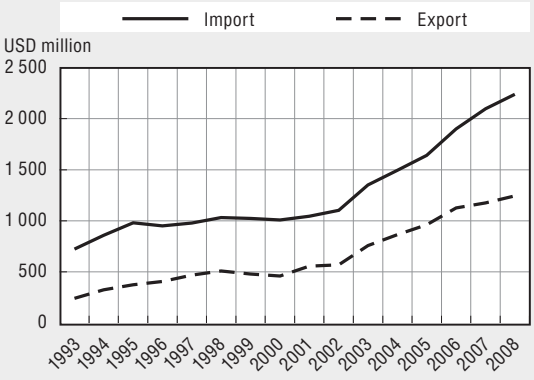
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD million)



Capacity

	2000	2008	% change
Number of fishers	691	735	6.4
Number of fish farmers	n.a.	150	n.a.
Total number of vessels	129	100	–22.5
Total tonnage of the fleet	23 221	19 007	–18.1

1. n.a.: not available.

Legal and institutional framework

The EU Common Fisheries Policy (CFP) sets out the boundaries for any national policy on the matter. From 2002 on, agriculture and fisheries have been regionalised matters in Belgium, which means that decisions are now taken at the level of the regional governments. In practice, all matters pertaining to marine fisheries are dealt with by the Flemish authorities, while aquaculture is a matter of consultation between Flanders and Wallonia.

Since the formal establishment of an Exclusive Economic Zone (EEZ) and the adoption of a specific law concerning the maritime environment in 1999, a national co-ordination exercise was started between the federal state and the Flemish region and resulted in the creation of a coast guard structure (8 July 2005). The EEZ law of 22 April 1999 sets out the coordination of the different existing sea fishery laws.

The Royal Decree of 14 August 1989 establishes complementary national measures for the safeguarding and management of fishing grounds and for the control of fishing activities. This decree was modified in December 2002 in order to limit access to the three nautical miles zone to fishing vessels with a tonnage of less than 70 GT. Recreational fishery is also regulated by this decree.

From 2003 onwards, the activities of non-professional anglers are also limited through a maximum quantity they are allowed to fish and to land.

A Decree of the Flemish Government of 16 December 2005 established a new system for fishing licenses and includes temporary measures for the conservation and sustainable exploitation of fish resources. This decree, which entered into force in February 2006, foresees the possibility of increasing engine capacity under certain conditions to a maximum of 1 200 kW for the large fleet segment.

The implementation of Council Regulation (EC) No. 744/2008 of 24 July 2008 grants the opportunity to shipowners to modernise their vessels with public support up to 60% of investment costs (main engine and fishing gear are excluded from this scheme). These investments have to be aimed at improving energy efficiency, lowering emissions and contributing to the fight against climate change.

This Regulation also provided the possibility to put in place a fleet adaptation scheme with public funding up to 60% for the replacement of the main engine or the fishing gear, provided that engine capacity is reduced by a minimum of 20% compared to the original vessel. Belgium chose to put this scheme in place in 2009 for the large fleet segment (> 221 kW). This system was implemented through decommissioning grants, whereby vessels could be decommissioned, adopted for an alternative activity or be partially decommissioned. For this last option, the remaining capacity could be transferred to a new vessel. In total nine vessels were accepted for the fleet adaptation scheme, seven were fully decommissioned and two were partially decommissioned. This constituted a total removal of 8 386 kW.

Important legal initiatives in 2008 and 2009 were as follows: the Belgian Operation Programme for the execution of the National Strategic Plan for the Belgian fisheries was approved by the European Commission (11 November 2008). This plan entails five priorities:

- adaptation of the Belgian fleet by reducing overcapacity and increased use of sustainable fishing gear;
- development of marine- and aquaculture;
- impoving sustainable management of fish stocks, better market functioning;
- sustainable management of fishing grounds; and
- technical assistance.

Capture fisheries

Structure and performance of the fleet

Tables 2.1 and 2.2 summarise key elements of the performance and structure of the Belgian fleet.

Table 2.1. **General performance of the Belgian fleet, 2007-09**

	2007	2008	2009
Number of vessels	102	100	89
Average capacity (kW)	594	606	579
Average tonnage (GT)	189	190	180
Total catches (tonnes)	21 793	20 012	19 171
Total value of catches (EUR million)	90,3	76.3	68.3
Mean value of catch (EUR/kg)	4,19	3.81	3.56
Mean gas oil price (EUR/l)	0.48	0.63	0.41

Table 2.2. **Structure of the Belgian fleet, 2007-09**

Group	Number of vessels			Average kW[2]			Average GT[2]		
	2007	2008	2009	2007	2008	2009	2007	2008	2009
Small fleet segment (KVS)[1] (≤ 221 kW)	48	47	47	219	219	215	91	90	78
KVS – Coastal fisheries (≤ 221 kW)	23	23	22	215	216	209	58	59	56
KVS – Eurokotters (≤ 221 kW)	20	20	20	221	221	221	107	109	106
KVS – Others (≤ 221 kW)	5	4	5	–	–		–	–	
Large fleet segment (GVS) (> 221 kW)	54	52	42	882	873	988	314	307	295
GVS – Beamtrawlers (> 662 kW)	46	46	35	907	898	1 061	324	315	321
GVS – Others (> 221 kW)	8	6	7	478	467	619	151	174	165

1. During 2006, the classification of the small fleet segment in coastal fisheries and Eurokotters was renewed. Therefore, some vessels that were previously Eurokotters are now considered as coastal fisheries.
2. Results of a number of financial accounts sent in for 2007 (n = 59), 2008 (n = 58) and 2009 (n = unknown).

Source: Uitkomsten van der Belgische Zeevisserij, 2007-09 – Publicatie van de Dienst Zeevisserij.

The most important management instruments on the input side are vessel licences and a collective system of fishing effort. On the output side, Belgium is using a collective quota system. The Belgian quota are divided on the basis of historical data between the small fleet segment and the large fleet segment.

In 2006, Belgium started a project on individual quota on the basis of individual calculations (historical part 2004-05 *versus* total catch of fishing vessels still registered on 1 January 2006). Participants registered before 1 March 2006 were not submitted to collective catch limitations, except for the geographical areas VIIIa,b. In 2006, only one vessel was interested in the individual quota system, none was registered in 2007. It was therefore decided not to continue the individual quota system from 2008 on.

In 2008, the average number of days at sea realised by the small fleet segment (KVS) decreased from 178 in 2007 to 176 (–1.1%). The average number of days at sea realised by the large fleet segment (GVS) also decreased significantly from 247 in 2007 to 228 (–8.3%). This is mainly caused by the high fuel prices.

All categories (except for the Eurokotters) suffer decreases in average total value. This is most probably due to the lower prices for fishery products. Tables 2.3 and 2.4 provide detailed information by fleet segment.

Table 2.3. **Statistical results of the financial accounts, 2007-08**

Mean values per vessel in EUR

Group	Average number of days at sea		Average total value		Average gross results		Average net profit/loss before taxes	
	2007	2008	2007	2008	2007	2008	2007	2008
Small fleet segment (KVS) (≤ 221 kW)	178	176	571 282	575 678	126 447	85 965	24 465	919
KVS – Coastal fisheries (≤ 221 kW)	165	160	322 718	320 329	75 971	51 041	19 376	3 878
KVS – Eurokotters (≤ 221 kW)	184	185	695 564	728 887	151 684	106 918	27 009	–857
KVS – Others (≤ 221 kW)	–	–	–	–	–	–	–	–
Large fleet segment (> 221 kW)	247	228	1 501 901	1 236 534	217 056	69 215	14 578	–86 540
GVS – Beamtrawlers (> 662 kW)	248	229	1 536 600	1 277 774	221 145	64 975	14 245	–97 433
GVS – Others (> 221 kW)	230	221	929 371	576 696	149 581	137 047	20 063	87 742

1. Sample size in 2007: 59; in 2008: 58; data for 2009 not yet available.

Source: Uitkomsten van de Belgische Zeevisserij, 2007-08 – Publicatie van de Dienst Zeevisserij.

Table 2.4. **Statistical results of the financial accounts, 2007-08**

Mean values per vessel in EUR

Group	Average number of days at sea		Average total value per day at sea		Average costs per day at sea		Average gross results/day at sea	
	2007	2008	2007	2008	2007	2008	2007	2008
Small fleet segment (KVS) (≤ 221 kW)	178	176	3 209	3 271	2 499	2 782	710	488
KVS – Coastal fisheries (≤ 221 kW)	165	160	1 956	2 002	1 495	1 683	460	319
KVS – Eurokotters (≤ 221 kW)	184	185	3 780	3 940	2 956	3 362	824	578
KVS – Others (≤ 221 kW)	–	–	–	–	–	–	–	–
Large fleet segment (GVS) (> 221 kW)	247	228	6 081	5 423	5 202	5 120	879	304
GVS – Beamtrawlers (> 662 kW)	248	229	6 196	5 580	5 304	5 296	892	284
GVS – Others (> 221 kW)	230	211	4 041	2 733	3 390	2 084	650	650

1. Sample size in 2007: 59; in 2008: 58; data for 2009 not yet available.

Source: Uitkomsten van de Belgische Zeevisserij, 2007-08 – Publicatie van de Dienst Zeevisserij.

Results per day at sea in 2008:

- Coastal fisheries: Total value increased less than costs, so the gross results decreased to 319 EUR/day at sea.
- Eurokotters: There was a large increase in costs of over 400 EUR/day at sea. This led to a decrease of the gross result from 824 (2007) to 578 EUR/day at sea in 2008.
- GVS – Beam trawlers: The average total value decreased significantly, while average costs stayed the same. The result was a large decrease from 892 (2007) to 284 EUR/day at sea.
- GVS – Others: A decreasing value combined with decreasing costs resulted in an overall status quo for this category.

Table 2.5 provides an overview of employment trends in the fisheries sector.

Table 2.5. **Employment trends, 2006-08**

	2006	2007	2008
Fishing	481	690	735
Fish processing	1 324	1 350	1 350
Aquaculture		137	150
Total		**2 177**	**2 235**

Management of commercial fisheries

In addition to the EU-rules and regulations, national measures are aimed at ensuring year round fishing activity of the national fleet. Thus, quota swaps with other EU member states increase the available quota of some species. In 2008, 28 quota swaps were accomplished, in this way quota for sole were increased by 25%, those for plaice and cod increased by 40 and 37% respectively. In 2009, 34 quota swaps were realised, increasing the quota for sole by 28% and for plaice by 27%. The quota for cod increased by 22%. Catch and activity limitations are imposed to ensure that the available quota last throughout the year. Nevertheless, some fishing grounds had to be closed prematurely for certain stocks: five in 2008, among which commercially important stocks such as sole (VIIe) and plaice (VIId,e), and three in 2009, though not for the most important stocks.

Management of recreational fisheries

In the legal framework a number of restrictions were adopted in order to limit the activity of recreational fisheries to reasonable levels and to avoid competition between professional and non-professional activities.

The use of towed gear for non-professional shrimpfisheries is restricted to the three nautical miles zone, with a number of additional restrictions concerning type of gear, catch composition, authorised period and legal use of the catch.

The use of static gear is strictly forbidden and angling is subject to catch limitations: in 2006 and 2009: max. 20 kg of cod and seabass per person and per seatrip, of which max. 15 kg can be cod. Even fishing activities on the beaches is strictly regulated in order to limit them to purely recreational activities.

Monitoring and enforcement

Data on fish sales in Belgian auctions (Zeebrugge, Oostende and Nieuwpoort) are received electronically and are complemented with information from the logbooks. Sales at foreign auctions – predominantly in the Netherlands – are also reported in electronic format on a monthly basis.

Since 2000, the complete fleet, with the exception of only three vessels smaller than 15 m overall lengths (LOA), has been equipped with vessel monitoring systems (VMS), allowing for a near-realtime follow-up of positions at sea.

An overview of other control activities is given in Table 2.6.

Table 2.6. **Other control activities**

Controls	2008	2009
In auctions	61	46
Elsewhere	20	24
At sea (boardings)	62	121
By airplane	334 vessels	374 vessels

The fishery protection vessels of the Navy and of the DAB-Fleet accomplished 99 days at sea in 2008 during which 62 boardings with a complete inspection of a fishing vessel were done. In 2009, 117 days at sea were accomplished which resulted in 121 boardings.

Belgium participated with seagoing assets in a joint deployment plan with neighbouring countries under the co-ordination of the CFCA (EU control agency). This happened three times in 2008 and four times in 2009.

An aerial surveillance programme was developed together with the authorities in charge of the application of the Bonn agreement.

In total, 30 serious infringements on fisheries regulations were reported in 2008 and 37 in 2009.

Government financial transfers

Table 2.7 provides an overview of government financial transfers in 2008 and 2009.

Table 2.7. **Overview of government financial transfers, 2008-09 ('000 EUR)**

	2008			2009		
	National contribution	EU contribution	**Total**	National contribution	EU contribution	**Total**
Direct payments						
Marine capture	316	246	**562**	1 649	4 892	**6 541**
Aquaculture	745	718	**1 463**	43	n.a.	**43**
Processing	326	434	**760**	52	45	**97**
Cost reducing transfers	. .	. .	**. .**	. .	. .	**. .**
General services	. .	. .	**. .**	. .	. .	**. .**
Structural adjustments	. .	. .	**. .**	. .	. .	**. .**
Total	**1 387**	**1 398**	**2 785**	**1 744**	**4 937**	**6 681**

In 2009, the implementation of the European Fisheries Fund reached full speed, especially due to Council Regulation (EC) No. 744/2008. A Fleet Adaptation Scheme (FAS) was executed which involved permanent cessation (scrapping) of 20% of the fleet capacity in kW and GT. The increased measures under Regulation 744/2008 provided for financial transfers, mainly for investments to improve fuel-efficiency in addition to the scrapping initiative.

Structural adjustment

In 2008, two fishing vessels were withdrawn from the fleet. By doing so, 296 GT (1.5%) were withdrawn from the fleet. The level of kW remained the same. In 2009, eleven vessels were withdrawn from the fleet. By doing so, a capacity of 11 507 kW (–15%) and 3 410 GT (–16%) was removed from the fleet.

Post harvesting policies and practices

Food safety falls within the competence of the Federal Food Agency (*www.favv-afsca.fgov.be*).

Markets and trade

Markets

Table 2.8 gives an overview of the Belgian consumption pattern from 2005 to 2009. In 2008, the average Belgian consumer bought nearly 6 kg of fresh fish, molluscs and crustaceans (–5% *versus* 2007). During the period 2008-09, consumption remained largely stable. In the beginning of 2009, there was a significant rise in purchases, due to lower prices.

Table 2.8. **Belgian consumption pattern, 2005-09**

	2005	2006	2007	2008	2009
A. Total fresh fish, molluscs and crustaceans (kg/capita)	6.82	5.84	6.28	5.98	6.33
of which (kg/capita and %):					
Fresh seafish	1.79 (26.2%)	1.83 (31.3%)	1.59 (25.4%)	1.53 (25.6%)	1.65 (26.0%)
Molluscs and crustaceans	4.13 (60.6%)	3.19 (54.6%)	3.81 (60.6%)	3.61 (60.3%)	3.83 (60.5%)
Fresh water fish	0.90 (13.2%)	0.82 (14.0%)	0.88 (14.0%)	0.84 (14.0%)	0.85 (13.4%)
Spendings for A (EUR/capita)	55.10	58.00	60.00	58.70	60.10
Mean price in EUR/kg for A	8.08	9.93	9.56	9.82	9.51
Penetration (%)	86.30	84.20	84.40	83.50	84.90
B. Total processed fish, molluscs and crustaceans (kg/capita)	5.02	5.36	5.40	5.79	5.55
of which (kg/capita and %):					
Preparations of fish, molluscs and crustaceans	2.25 (47.2%)	2.48 (46.3%)	2.54 (47.0%)	2.78 (48.0%)	2.52 (45.4%)
Frozen fish, molluscs and crustaceans	1.60 (30.2%)	1.68 (31.4%)	1.75 (32.3%)	1.83 (31.6%)	1.82 (32.8%)
Smoked fish	0.86 (17.1%)	0.88 (16.4%)	0.86 (16.0%)	0.89 (15.4%)	0.93 (16.7%)
Canned fish	0.31 (06.2%)	0.32 (06.0%)	0.26 (04.8%)	0.29 (05.0%)	0.28 (05.0%)
Total A + B	**11.84**	**11.20**	**11.68**	**11.77**	**11.88**

In 2000, two out of three families bought fresh fish. This figure has decreased to 54% in 2009. Fresh water fish is a rather stable market.

The market for processed fish, molluscs and crustaceans reached a peak in 2008 with an annual average per capita consumption of 5.79 kg. The numbers dropped slightly in 2009, to 5.55 kg/capita. Consumption of preparations of fish, molluscs and crustaceans increased from 1.93 kg/capita in 2000 to 2.78 kg/capita in 2008 and 2.52 kg/capita in 2009 (+30.5%). Frozen fish is a user-friendly, thus growing market. However, preparations that consist of fishery products which have increased in price, are losing ground.

For the sale of fish, molluscs and crustaceans, in the long term, there is a clear increase of hard discounters (Aldi, Lidl, etc.) and small supermarkets (Dis 2). In 2007, hard discounts accounted for 26% of the market. Dis 1 (supermarkets like Carrefour, Delhaize, etc.) remain the most important market outlets with 44.2%, though their share is decreasing. Specialised fish mongers and markets see a decrease of their market share to 11.6% and 6.9% of the total sale. For fresh seafish and preparations of fresh fish, specialised fish mongers and markets remain more important with a market share of 26.3 and 15.2% respectively in 2009.

Trade

From the perspective of the national economy, the fishing industry in Belgium is of marginal importance. Its share in the national GDP and contribution to employment is very low, but fish trade has become increasingly important and is continuing to grow significantly during the last decade. However, during the last years there is a small decline in trade patterns, for both import and export.

Belgium's degree of self-sufficiency in fisheries products is very low. In 2008, imports by value were 17 times higher than the total landings of the Belgian fleet (EUR 1.169 million *versus* EUR 68.3 million). Even though a large share of the local production is consumed fresh domestically, Belgium is a major fish-trading nation. A substantial part of the landings, and of fish imports, is exported. This mainly concerns sole, cod, whiting and plaice. The major export markets are the Netherlands, France, Denmark, Germany, United Kingdom and Spain. In 2007 and 2008, trade patterns have gone down slightly. Exports

have decreased from EUR 719 million in 2006 to EUR 681 million in 2008 (–5.6%). Imports have also gone down from EUR 1.196 million in 2006 to EUR 1.169 million in 2008 (–2.5%). Table 2.9 summarises trade flows for the period 2006-08.

Table 2.9. **oreign trade by Belgium in fishery products, 2006-08 ('000 EUR)**

	2006		2007		2008	
	Import	Export	Import	Export	Import	Export
Live fish	22 660	3 409	22 202	3 674	21 540	3 001
Fresh fish (excluding filets and fish meat)	123 064	76 603	112 965	72 530	111 883	63 235
Frozen fish (excluding filets and fish meat)	42 184	32 469	37 814	21 842	49 303	29 610
Fish filets and fish meat	372 972	232 198	359 596	225 505	349 679	221 611
Fish salted, smoked and dried; fishmeal for human consumption	59 878	11 967	64 476	14 077	59 887	14 598
Crustaceans	410 472	288 946	421 054	287 218	420 423	294 943
Molluscs	167 542	73 958	161 145	54 420	156 973	54 146
Total	**1 198 773**	**719 550**	**1 179 252**	**679 266**	**1 169 688**	**681 144**

Source: National Bank of Belgium.

Outlook

On a national level, the poor condition of many fish stocks combined with high fuel prices encourage the continued search for more environment-friendly and less fuel-intensive fishing techniques which should lead towards a sustainable and profitable fleet.

The simplification introduced to the collective quotasystem in 2006 will be continued from 2008 on: more quota will be attributed on the basis of motorcapacity and for fixed periods in the year.

After termination of the 2009 decommissioning scheme within the framework of the Belgian fleet adaptation plan, no additional finacial support will be made available for scrapping. Further scrapping to reach the objectives of the Operational Programme will be made possible with sector means. Vessel owners will receive extra catch possibilities if they scrap fishing capacity from 2011 on.

In view of the current reform process of the Common Fisheries Policy, signifcant changes are to be expected from 2013 on. Moreover, the implementation of the Control Regulation (EC) No. 1224/2009 and the implementation of the IUU-regulation (EC) No. 1005/2008 will have to be finalised in the near future.

PART III

Chapter 3

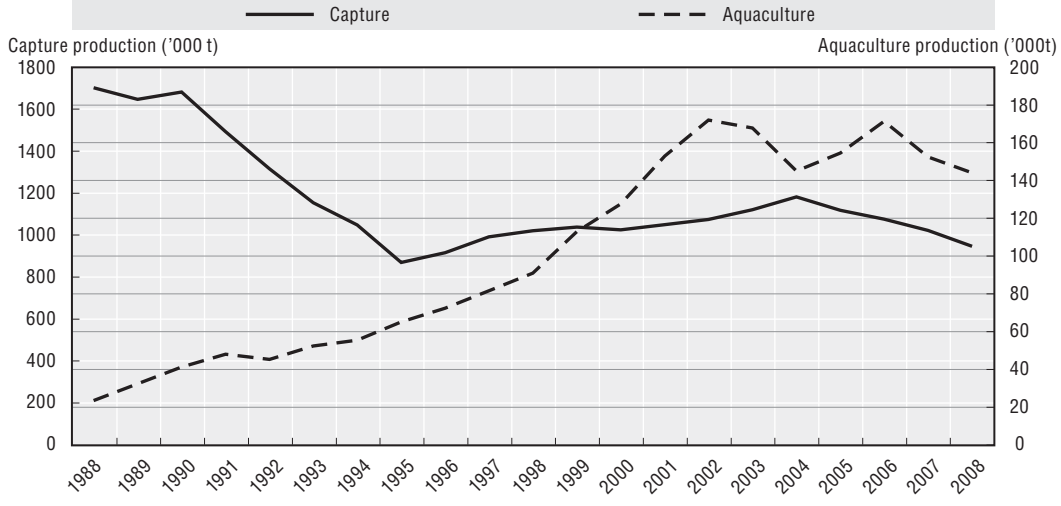
Canada

Canada

Summary of recent developments

- Canada continued in 2008 and 2009 to renew its commercial fisheries policies. A key component of this renewal is the Sustainable Fisheries Framework (SFF), which provides the basis for ensuring Canadian fisheries are conducted in a manner that supports conservation and sustainable use. The SFF incorporates existing fisheries management policies with new and evolving policies, and includes tools to monitor and assess initiatives, and identifies areas that may need improvement.
- In December 2006 and November 2007, the Canadian government tabled bills in Parliament to reform the Fisheries Act, originally enacted in 1868. However, both efforts ended when Parliament was suspended before the bills were signed into law. The government indicated in 2010 that it would again seek such a reform.
- The capture fisheries sector faced a number of challenges during 2008 and 2009, including the global economic crisis that reduced demand for Canadian fish products, and the increasing value of the Canadian dollar that made exports relatively more expensive in major markets.
- The National Aquaculture Strategic Action Plan Initiative (NASAPI) was launched as a collaborative exercise to enhance and advance economically, environmentally and socially sustainable aquaculture development. NASAPI has generated action plans that will facilitate responsible growth through a more strategic approach to sector development.
- "Economically prosperous maritime sectors and fisheries" is now included as one of Fisheries and Oceans Canada's strategic outcomes, along with "sustainable aquatic ecosystems" and "safe and secure waters."

Harvesting and aquaculture production (tonnes)

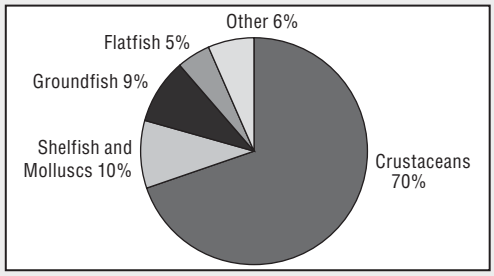


Source: FAO FishStat Database.

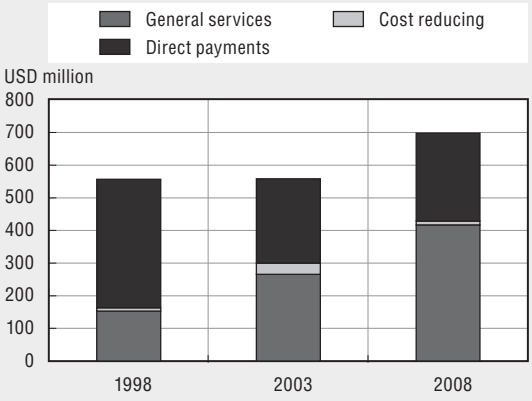
Key characteristics of the sector

- The total value of the Canadian fisheries production slightly dropped from CAD 1.959 billion in 2007 to CAD 1.893 billion in 2008. The most important species landed in 2008 in terms of value were crustaceans (70%) followed by shellfish and molluscs (10%), groundfish (9%) and flatfish (5%).
- Total expenditure of the Government in relation to the fisheries sector reached CAD 697.5 million in 2008, which is a 25% increase compared to the expenditure in 2003. The majority (60%) of these expenditures are accounted for by general services.
- Canada has been a net exporter in the world fish market over the decades, and the value of both imported and exported products have increased. However, the global economic crisis during 2008 and 2009 reduced demand for Canadian fisheries products, and the increasing value of the Canadian dollar made Canadian exports relatively more expensive in major markets.
- The total number of vessels was 21 797 in 2008, which is a decrease (8.5%) compared to of the number in 2000 (23 809).

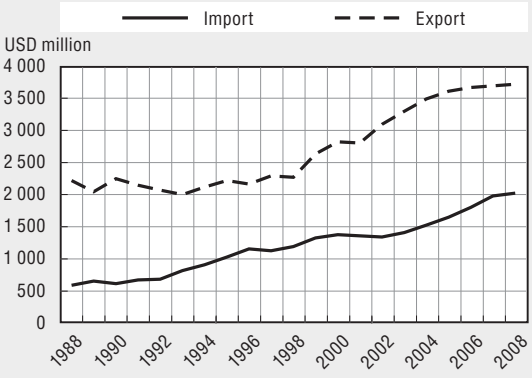
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	n.a.	52 812	n.a.
Number of fish farmers	n.a.	4 900	n.a.
Total number of vessels	23 809	21 797	–8.5
Total tonnage of the fleet	n.a.	n.a.	n.a.

Legal and institutional framework

The federal (*i.e.* national) government is responsible for the conservation, protection, and sustainable use of all fisheries and fish habitat in Canadian marine waters. This authority is granted to the Minister of Fisheries and Oceans under the Constitution Act of 1867 and administered by Fisheries and Oceans Canada (DFO). However, the federal government has delegated the management of inland fisheries to the provinces (with the exception of Newfoundland and Labrador), while still retaining its jurisdictional responsibility. The federal government, working in partnership with the provincial and territorial governments (*i.e.* sub-national governments), is also responsible for the sustainable development of the Canadian aquaculture industry. The British Columbia Supreme Court ruled in February 2009 that aquaculture is a fishery and falls under exclusive federal jurisdiction, and in response the Government of Canada, in 2009 and 2010, developed the Pacific Aquaculture Regulations to govern aquaculture in British Columbia and along the Pacific coast (described in more detail below). Provinces and territories have jurisdiction over fish handling and processing, while the federal government has jurisdiction over inter-provincial and international trade in fish and seafood products.

Discussion of and co-operation on fisheries and aquaculture issues among different levels of government has been facilitated in the last decade by the Agreement on Interjurisdictional Co-operation with Respect to Fisheries and Aquaculture, signed by Ministers from all jurisdictions in 1999. The Agreement committed governments to co-operate within a formal structure: the Canadian Council of Fisheries and Aquaculture Ministers (CCFAM). It also formally established a committee of Deputy Ministers and a committee of senior officials, the Interjurisdictional Working Group, to support the activities of the Ministers' Council and monitor the progress of annual work plans.

Canada's primary statute for the conservation and protection of fish and fish habitat is the *Fisheries Act*. Under the authority granted by the Act, a variety of instruments are employed to manage Canadian fisheries: primarily total allowable catches (TACs), but other common measures include individual quotas and a variety of technical measures related to the size, age and/or sex of fish that may be landed, and the areas and/or times of fishing opportunities.

There are some restrictions on foreign investment in Canadian fisheries. Foreign interests may hold no more than 49% of the controlling interest of a Canadian corporation that is licensed to fish. Failure to abide by this restriction can result in non-renewal of the fishing license in question.

Capture fisheries

Performance

Canadian commercial landings of fisheries products totalled just over 900 000 tonnes annually in 2008 and 2009 (Table 3.1). The 2008 landings represented a 7.4% decrease from one year earlier, driven largely by decreases in landings of Atlantic herring and Pacific salmon, while value remained about constant. From 2008 to 2009, landed quantities decreased slightly but value decreased by 13%, largely due to decreases in prices brought about by the economic crisis that began in 2008. The majority of the landed value of Canada's fisheries is accounted for by three species primarily caught on the Atlantic coast (lobster, snow crab, and shrimp) that together accounted for about two-thirds of the total value of the fishery in 2008 and 2009. Approximately 50 000 people were employed as

commercial fish harvesters in 2008, with a further 25 000 employed in seafood product preparation and packaging.

Table 3.1. **Landed quantities and values of capture fisheries products from Canada's Atlantic and Pacific fisheries from 2007 to 2009**

	2007			2008			2009		
	Atlantic	Pacific	Total	Atlantic	Pacific	Total	Atlantic	Pacific	Total
Quantity	833	169	1 001	785	150	936	768	157	925
Value	1 677	282	1 959	1 646	247	1 893	1 391	250	1 641

Note: Landings from Arctic fisheries are included under the Atlantic heading. Quantities are in thousands of metric tonnes, while values are in millions of Canadian dollars.

Status of fish stocks

Canada has recently begun using a Fishery Checklist, initially developed in 2007, as a tool to collect data on major stocks and fisheries that can be used for various reporting purposes. The Checklist includes more than 100 questions that are broadly divided into three topics: science (*e.g.* stock status, presence of stock reference points), fisheries management (*e.g.* adequacy of monitoring and harvest rules), and enforcement (*e.g.* degree of compliance with fisheries management measures). The questions seek data for the following eight axes: information; stock assessment; harvest tools; stock status; biodiversity; habitat and ecosystems; governance; and conservation and protection.

The Checklist has been used in recent years to assess the status of a subset of fisheries and fish stocks in Canada. Status is determined by assessing stock abundance relative to a limit reference point (LRP) and an upper stock reference (USR). Stocks with abundance less than their LRP are deemed "critical", those with abundance greater than their LRP but less than their USR are "cautious", while those greater than their USR are "healthy". The subset assessed for 2009 is different from that assessed for 2008, and the methodology was changed between years. As such, the results of the two years are not comparable, but together give a snapshot of the status of a significant number of Canadian fisheries during this period.

Of the 69 stocks for which status was assessed for 2008 using the Checklist, eight were critical, 24 were cautious and 37 were healthy. The status of 84 stocks was assessed for 2009, with ten being assessed as critical, 32 as cautious, and 42 as healthy. Over the two years for which data are available, most groups of species had a mix of cautious and healthy stocks, with relatively few considered critical. About half of all gadoid stocks assessed were considered critical while more than half of all assessed flatfish, invertebrates, and "other finfish" (mostly lake whitefish and Arctic char) were classified as healthy.

DFO conducts a variety of scientific studies on the status of fish stocks and species, and on a number of related issues. The results of many of these studies are published by the Canadian Science Advisory Secretariat and can be found at *www.dfo-mpo.gc.ca/csas-sccs*.

Management of commercial fisheries

Management instruments

Canada continued in 2008 and 2009 to move ahead with a renewal of its fisheries policies. A key component of this renewal is the Sustainable Fisheries Framework[1] (SFF), which provides the basis for ensuring Canadian fisheries are conducted in a manner that supports conservation and sustainable use. The Framework incorporates existing fisheries

management policies with new and evolving policies, and includes tools to monitor and assess initiatives geared toward ensuring an environmentally sustainable fishery, and identifies areas that may need improvement. Overall, the SFF is designed to provide the foundation of an ecosystem-based and precautionary approach to fisheries management in Canada.

The SFF was developed through engagement with resource users and others with an interest in sustainable fisheries. Combined with reforms to socio-economic policies and initiatives, the SFF is a key instrument in developing environmentally sustainable fisheries that also support economic prosperity in the industry and fishing communities.

The framework comprises two main elements: 1) conservation and sustainable use policies; and 2) planning and monitoring tools.

Conservation and sustainable use policies incorporate precautionary and ecosystem-based approaches into fisheries management decisions to support the continued health and productivity of Canada's fisheries and healthy fish stocks, while striving to protect biodiversity and fisheries habitat. Combined, these policies demonstrate Canada's commitment to the principles of ecosystem-based fisheries management. These policies include:

- a Fishery Decision-Making Framework Incorporating the Precautionary Approach;
- managing Impacts of Fishing on Benthic Habitat, Communities and Species; and
- policy on New Fisheries for Forage Species.

Other DFO conservation and sustainable use policies that support the SFF include:

- Canada's Policy for Conservation of Wild Atlantic Salmon; and
- Pacific Wild Salmon Policy.

Over time, new policies will be added to the Framework to address other issues, including by-catch, and possibly top fish predators in marine ecosystems, and the impact of lost fishing gear.

The conservation and sustainable use policies will be implemented in the fisheries management process through various **planning and monitoring tools**. Integrated Fisheries Management Plans (IFMPs) identify goals related to conservation, management, enforcement, and science for individual fisheries, and describe access and allocations among various fish harvesters and fleet areas. The Plans also incorporate biological and socio-economic considerations that are factored into harvest decisions. IFMPs are an important reporting tool, and a valuable source of information on a given fishery for fisheries managers, industry, and other resource users. They also include a requirement to conduct a regular review of the fishery against the Plan's objectives. In addition, self-diagnostic tools like the Fishery Checklist (a tool for internal use) can help the Department monitor improvements that support sustainable fisheries, and identify areas of weakness that require further work.

While applying the policies and tools of the SFF in the decision-making process for each fishery, DFO ensures that the biological and socio-economic consequences of all proposed management measures are considered. The policies and tools included in the SFF will also be linked to broader integrated management processes, such as the planning forums for managing sections of Canada's oceans known as Large Ocean Management Areas.

The Framework and its policies are being implemented progressively over time. This phased approach is being conducted according to the priorities identified through fishery planning sessions held across DFO regions that began in 2009. The implementation of the Framework, including changes to harvest arrangements, is also the subject of engagement

with Aboriginal groups. The Framework will continue to evolve as new policies and tools are developed. The implementation process will use adaptive management principles, where experience applying the policies to fisheries management will guide future applications. The Department will review implementation progress after three years and use lessons learned to make any necessary adjustments.

Access arrangements for foreign fleets

Access to Canada's exclusive economic zone (EEZ) for the purposes of fishing is provided for through bilateral treaties, with two such treaties in effect. Canada's Pacific albacore tuna fishery is conducted in the coastal waters of Canada and the United States, and in the high seas. The Canada-US Pacific Albacore Tuna Treaty allows Canadian and US vessels reciprocal access to each other's waters for harvesting activities and to land catches in a limited set of ports (designated under the Treaty) in the other country. Under the agreement, 110 Canadian vessels have access to US waters to fish for albacore tuna each year from 15 June until 31 October. The provisions of the current Treaty are in effect until the end of the 2011 fishing season, at which time Parties must reach a renewed agreement in order for reciprocal access to continue.

On Canada's Atlantic coast, the 1972 Agreement between Canada and France on their Mutual Fishing Relations calls for reciprocal fishing rights for France and Canada in each other's waters. The maritime boundary between the two countries with respect to Saint-Pierre et Miquelon (SPM) was delimited in June 1992. This was followed by the 1994 *Procès-Verbal* applying the 27 March 1972 Agreement between Canada and France on their Mutual Fishing Relations (or "PV" for short), established as the result of bilateral negotiations on how to manage transboundary stocks in Northwest Atlantic Fisheries Organization (NAFO) area 3Ps (near the south coast of Newfoundland and around SPM). Under the PV, France receives a set percentage of TACs for transboundary stocks of Atlantic cod, American plaice, witch flounder, Iceland scallop, squid, and redfish, as well as fixed allocations of several other stocks found solely in Canadian waters (Atlantic cod, Greenland halibut, grenadier, redfish, and silver hake). Canadian fishers have access to a portion of the TAC for an Iceland scallop fishery that is located primarily in French waters. In all of the above-listed fisheries, Canadian and French vessels have reciprocal access to each other's waters in order to catch their respective allocations. The PV will be automatically renewed for an additional five-year period on 17 April 2012 unless Canada or France indicates by 16 October 2011 that they want to renegotiate it.

Canada's Port Access Policy

Canada implemented its Port Access Policy in 2003 through the Coastal Fisheries Protection *Act and Regulations*. The Policy is based on the concept of a "closed-port" approach whereby the Minister of Fisheries and Oceans has the discretion to grant a license to foreign fishing vessels to enter Canadian waters and ports, subject to certain limitations set out in the Act and Regulations. The Minister also has an obligation to close ports to vessels flying the flag of any state that has unsatisfactory fisheries relations with Canada. Under the Regulations, Canada has the mandate to control port entry and use of port services in respect of any vessel that is transporting fish, equipped or used for fishing, or processing or transporting fish from fishing grounds, as well as support vessels used or equipped for provisioning, servicing, repairing or maintaining foreign fishing vessels at sea.

As a responsible member of various regional fisheries management organisations (RFMOs), Canada supports and encourages collaborative efforts to reduce illegal, unreported and unregulated (IUU) fishing. For example, Canada has agreed not to allow entry to vessels on the IUU lists of NAFO or the International Commission for the Conservation of Atlantic Tunas (ICCAT). These IUU vessel lists are key tools for combating IUU fishing globally. Arrangements have already been undertaken among several RFMOs to share their lists so that members can take the necessary action to deny port entry or services to such vessels, thus making IUU fishing increasingly difficult and expensive.

Management of recreational fisheries

Recreational fishing is popular with Canadians and tourists, with an estimated 3.2 million people participating each year. In 2005, the last year for which national survey data are available, anglers spent CAD 2.5 billion on consumable goods and services associated with recreational fishing, such as transportation, food and lodging, and supplies. They spent an additional CAD 5.0 billion on durable goods related to their recreational fishing activities, such as fishing equipment, boats, motors, and camping equipment. Anglers caught 215 million fish of all species in 2005, and retained almost 72 million of these.

Managing Canada's recreational fisheries is a shared responsibility between federal, provincial and territorial governments. While roles vary between different provinces and territories, generally the federal government is responsible for all marine species (with the exception of anadromous and catadromous species in inland waters in some regions), while provincial and territorial governments are responsible for freshwater species.

Aboriginal fisheries

Fishing rights for Canada's Aboriginal people are shaped by several pieces of legislation, foremost by the Constitution Act of 1982, which recognises "existing Aboriginal and treaty rights of Aboriginal people" to fish. Two key Supreme Court of Canada decisions in the 1990s further specified these rights, as described below.

In 1990, the Sparrow decision described an Aboriginal right to fish for "food, social and ceremonial purposes." This decision led to the establishment of a collaborative DFO approach aimed at integrating First Nations participation into established fisheries across Canada. The decision was implemented nationwide through programmes including: the Aboriginal Fisheries Strategy (AFS), initiated in 1992, which provides negotiated agreements for harvesting plans for food, social and ceremonial (FSC) fisheries and involvement in fisheries co-management; the Allocation Transfer Programme (ATP), begun in 1994, which provides commercial fisheries-related economic opportunities; and the Aboriginal Aquatic Resource and Oceans Management Programme (AAROM), started in 2004, which supports the involvement of Aboriginal groups in integrated watershed/ecosystem-based planning and management processes.

In 1999, the *Marshall* decision established commercial fishing rights for certain Atlantic First Nations to earn a "moderate livelihood." The decision led to increased DFO collaboration aimed at integrating First Nations commercial fishing participation into established fisheries in Atlantic Canada. The resulting Marshall Response Initiative (MRI) involved transferring licenses/quotas and fishing vessels/gear to participating First Nation communities, and provided additional support for commercial fisheries capacity building

within these communities. Although the *Marshall* decision related to certain areas of Atlantic Canada, other Aboriginal groups in coastal areas were to benefit from similar programmes.

Two key current programmes are the Atlantic Integrated Commercial Fisheries Initiative (AICFI), and the Pacific Integrated Commercial Fisheries Initiative (PICFI). AICFI was launched in 2007 to sustain the public investment made in the Mi'kmaq and Maliseet First Nations' (MMFNs) commercial fisheries through the MRI, and to work with MMFNs to continue to build their capacity to manage successful commercial fishing enterprises and participate in the co-management of the integrated commercial fisheries along with other commercial harvesters. The initiative affects 34 MMFNs in the provinces of Nova Scotia, New Brunswick, Prince Edward Island, and Quebec.

An evaluation of the programme covering the years 2007-09 found that it had been successful in a number of respects, including: increasing MMFNs' access to fishery information management; improving community capacity through funding various skilled fisheries positions; increasing MMFNs' access to opportunities for business development and diversification; increasing the skills of MMFNs to fish safely and successfully; and improving relations with DFO and other stakeholders.

PICFI was launched in 2007 with the aim of supporting environmentally sustainable and economically viable integrated Pacific commercial fisheries, where conservation is the first priority and First Nations' aspirations to be more involved are supported. Key elements of PICFI are: acquisition of access to a broad range of fisheries resources through voluntary retirement of existing commercial licenses or quota, and allocation of this access to First Nations to increase their opportunities for participation in commercial fisheries; enhancement of fisheries monitoring, catch reporting, and enforcement, and establishment of a basis for a new approach to trace fish from harvest to consumer; capacity-building to provide eligible First Nations with the tools necessary to support successful and sustainable community-owned and operated commercial fisheries enterprises; and strengthened collaboration among First Nations, industry, government, and other interests in managing the fishery which supports transition to clear harvest sharing arrangements for the salmon fishery.

The emphasis in PICFI during 2008 and 2009 was largely on building foundations for the longer-term objectives of the programme. First Nations and First Nations aggregates submitted expressions of interest as the first step to business and training plan development, and to receiving access in the commercial fishery and capacity building to take best advantage of that access. Almost CAD 26 million worth of access (licenses and quotas) in a range of fisheries was relinquished under PICFI in preparation for distribution in future years. A variety of processes were developed or supported to facilitate co-management relationships and co-operative relationships more generally. Finally, PICFI facilitated the development of standardised and co-ordinated catch data management systems, improvements to catch monitoring mechanisms in a variety of fisheries, and the first steps in a move to intelligence-based enforcement mechanisms.

Monitoring and enforcement

DFO is responsible for enforcing the *Fisheries Act*, the primary legislation governing fisheries management in Canada, as well as other legislation and regulations. Enforcement activities are carried out by fishery officers across Canada who conduct regular patrols on the land, on the sea and in the air, in some cases jointly with other States. DFO also

promotes compliance with the law through education and awareness activities that encourage Canadians to protect fishery resources and habitats.

In 2008 and 2009, Canada continued to implement the recommendations of the Compliance Review and Modernization of DFO's Conservation and Protection (C&P) programme. This has included recruitment of new fishery officers to meet demand for services, and the development of a National Compliance Framework (NCF) to shape the future of the programme. The NCF is organised around three pillars. First, it recognises the need for greater emphasis on promotion of voluntary compliance through education and engagement of stakeholders. It also recognises that traditional monitoring, control and surveillance activities will continue to be the backbone of the compliance programme, but that new technologies and strategies must be incorporated to make the best use of available resources (*e.g.* co-ordinated port state measures). Finally, the model identifies the need for the programme to focus attention, through special investigations and the pursuit of major cases, on illegal activities by a relatively small number of individuals that pose a serious threat to the achievement of conservation objectives.

The launch and deployment of Radarsat-2 in December of 2007 made available to C&P a second-generation commercial Synthetic Aperture Radar (SAR) satellite. This allowed C&P to begin experimenting with space-based remote sensing technologies, with the eventual goal of integrating this asset into an already established surveillance programme. With logistical assistance from Polar Epsilon, the Canadian Department of National Defence's (DND) project for the exploitation of Radarsat-2 and the Automatic Identification System (an automated tracking system used for identifying and locating vessels), C&P was able to field-test the capabilities of the satellite in both the North Pacific (September 2008, 2009 and 2010) and in the Northwest Atlantic (February 2009). In addition to exploiting the technology to maximise Canada's international contributions to combating IUU fishing through several international organisations, C&P has also begun to test the system's effectiveness domestically, including in remote areas.

Multilateral agreements and arrangements

Canada participated in many multilateral negotiations and agreements during 2008 and 2009. Canada took part in the negotiation of the FAO International Guidelines for the Management of Deep-sea Fisheries in the High Seas and supported their adoption in 2008, and participated in both years in the negotiation of the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA), leading up to the Agreement's approval by FAO members in November 2009. Canada signed the Agreement in November 2010. Canada also played an active role in negotiating the Sustainable Fisheries and Law of the Sea Resolutions in the United Nations General Assembly (UNGA) in these years. Lastly, Canada participated actively in the 2009 review of actions taken to identify and protect vulnerable marine ecosystems (VMEs) under UNGA Resolution 61/105, which in 2006 had proposed new precautionary management commitments for VME protection.

Canada participates in a number of regional fisheries management organisations (RFMOs) and similar bodies (Table 3.2). Canada co-led with the European Union a process for members of NAFO to adopt an amended Convention for the Organization in 2007, which the Canadian Government ratified in late 2009. The amended Convention provides for better management decisions that incorporate precautionary and ecosystem-based approaches, improves governance by limiting objections, and provides a robust dispute

settlement mechanism. With strong support from Canada, NAFO has also taken specific steps to adopt an ecosystem-based approach to fisheries management, for example, through research and analysis to identify and protect vulnerable marine ecosystems in its Regulatory Area (NRA), and the closure in 2009 of 11 coral and sponge areas to bottom fishing. NAFO also took steps to improve monitoring and enforcement in the NRA, and in 2009 Canada outlined potential future proposals to enhance the NAFO Conservation and Enforcement Measures.

Table 3.2. **RFMOs and similar bodies in which Canada participates**

Organisation	Canada's role
Northwest Atlantic Fisheries Organization (NAFO)	Member
International Commission for the Conservation of Atlantic Tuna (ICCAT)	Member
North Atlantic Salmon Conservation Organization (NASCO)	Member
North Pacific Anadromous Fish Commission (NPAFC)	Member
Western and Central Pacific Fisheries Commission (WCPFC)	Member
Inter-American Tropical Tuna Commission (IATTC)	Non-Contracting Co operating Party 2001-09; Member starting 2010
North East Atlantic Fisheries Commission (NEAFC)	Non-Contracting Co-operating Party
Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR)	Non-Contracting Co-operating Party
North Atlantic Marine Mammal Commission (NAMMCO)	Observer

In 2009, Canada joined the negotiations to establish a North Pacific RFMO, a process that began in 2006. Canada is seeking to ensure that the Convention text establishes the framework for a modern and cost effective RFMO that is consistent with the United Nations Fish Stocks Agreement. Canada also participated as an observer in the South Pacific RFMO process.

Canada has been engaged in the Kobe Process, which is working toward the harmonisation and co-ordination of tuna RFMOs since their first joint meeting in Kobe, Japan, in 2007. Canada is seeking the implementation of key recommendations that have resulted from this initiative within the RFMOs of which Canada is a member. Canada has continued to work within individual tuna RFMOs in an effort to strengthen decision-making and improve the overall management of tuna species, using the principle of sustainable management based on scientific advice. Within ICCAT, Canada has long been a strong advocate of strengthening the decision-making of the organisation. To this end, a resolution adopted in 2008 created the Future of ICCAT Working Group, which held its first meeting in 2009. The goal of this Working Group is to identify both short-term and long-term actions that can be implemented by the Commission to improve the overall management of tuna species in the Atlantic. Canada has also continued to push for the adoption of sustainable management measures for species such as Atlantic bluefin tuna, North Atlantic swordfish and porbeagle shark.

Within the Western and Central Pacific Fisheries Commission (WCPFC), Canada: led in the development of the WCPFC strategic plan in 2009, which set out a vision for the Commission for a five-year period; and promoted the use of the Kobe Strategy Matrix on a pilot basis to convey scientific advice for Pacific bigeye tuna. Within the Inter-American Tropical Tuna Commission (IATTC), Canada ratified the Antigua convention in 2009, which was an update of the original 1949 IATTC Convention.

Aquaculture

Policy changes

The aquaculture sector in Canada exists in diverse regions across the country and in a complex jurisdictional context involving the participation of municipal, provincial/territorial and federal governments, as well as First Nations. Additionally, aquaculture is not defined in Canadian law. Policy development and regulation in the sector thus present unique challenges in Canada.

In February 2009, the British Columbia Supreme Court ruled that the activity of aquaculture is a fishery that falls under exclusive federal jurisdiction, and struck down the provincial regulatory regime governing aquaculture in the province. In response to that decision, the government of Canada developed the Pacific Aquaculture Regulations to govern aquaculture in British Columbia and along the Pacific coast under the Fisheries Act. Finfish, shellfish and freshwater aquaculture operations within the province now require a federal aquaculture license issued under the Fisheries Act and a federal Navigable Waters Protection Act permit. The Province of British Columbia will continue to issue tenures (leases) where operations take place in either the marine or freshwater environment, and will continue licensing marine plant cultivation and managing business aspects of aquaculture, such as workplace health and safety. These regulations will result in increased environmental monitoring of the aquaculture industry in British Columbia, as well as increased compliance monitoring and enforcement. The new regulations are also expected to streamline the management regime for aquaculture in British Columbia and improve integration, transparency, and regulatory efficiency.

Another key initiative in Canada's aquaculture sector is the National Aquaculture Strategic Action Plan Initiative (NASAPI). Under the leadership of the Canadian Council of Fisheries and Aquaculture Ministers (CCFAM), NASAPI was launched as a national, collaborative exercise to enhance and advance economically, environmentally and socially sustainable aquaculture development throughout Canada, as a way of helping fulfil Canada's inherent potential in aquaculture through a more strategic approach to sector development.

The initiative began in 2009 with a 20-month DFO-led extensive and inclusive consultation process, which drew more than 500 representatives from federal and provincial governments, industry, fish feed suppliers, Aboriginal groups, non-governmental organisations, academia and others. These consultative sessions generated considerable input regarding the scope and nature of the many challenges and opportunities related to aquaculture development. They also provided numerous suggestions to help formulate solutions to specific issues and helped to establish a more co-operative position from which to address and resolve challenges. The data and information compiled from these consultations were then analysed and initial drafts of action plans have since been prepared, and then reviewed and edited by all-stakeholder steering committees. CCFAM gave its formal approval to the NASAPI Initiative during its annual meeting in November 2010.

NASAPI has generated targeted action plans that will facilitate responsible growth in five sub-sectors of the Canadian aquaculture industry (east coast marine finfish and shellfish, west coast marine finfish and shellfish, and national freshwater). The initiative is a dynamic, living process, and the action plans will be revised and updated regularly to keep them current, on-track and progressive, leading toward solutions to emerging challenges and opportunities in the sector. The implementation structure developed for these action plans

is intended to foster improved collaboration between industry, the federal and provincial governments, First Nations and other Aboriginal groups, and other pertinent stakeholders to efficiently and effectively advance sustainable economic development.

More information on NASAPI is available on DFO's website at *www.dfo-mpo.gc.ca/aquaculture/lib-bib/nasapi-inpasa/index-eng.htm*.

Production facilities, values and volumes

In 2006, the last year for which complete data are available, there were 642 aquaculture establishments in Canada. The sector employed 3 970 people in 2008, and produced 156 000 tonnes of fish and seafood worth CAD 801 million. Most aquaculture production (67% by weight, 78% by value) in Canada in 2008 was comprised of salmon products. The majority of salmon production was Atlantic salmon produced on both the Atlantic and Pacific coasts, with almost three-quarters of this being produced in British Columbia. The other major species produced were sea trout, mussels and oysters.

Fisheries and the environment

Environmental policy changes and sustainable development initiatives

Canada has taken action both domestically and internationally in developing policy and instruments that help to manage the effects of a variety of activities on marine environments.

Much of Canada's approach to sustainable development and environmental policy related to fisheries is embodied in the SFF described earlier in this chapter. One key component of the SFF with respect to environmental impacts of fishing is the "Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas," which applies to all commercial, recreational, and Aboriginal marine fishing activities that are licensed and/or managed by DFO both within and outside Canada's exclusive economic zone. The policy deals with historically fished areas and "frontier" areas[2] in distinct ways. The policy outlines five key steps: 1) assemble and map existing data and information to help determine the extent and location of benthic habitat types, features, communities and species; 2) assemble and map existing information and data on the fishing activity in question; 3) based on all available information assess the risk that the activity is likely to cause harm to the benthic habitat, communities and species, and particularly if such harm is likely to be serious or irreversible; 4) determine whether management measures are needed, and implement such management measures; and 5) monitor and evaluate the effectiveness of the management measures and determine whether changes are required. The Policy was adopted in 2009 and is being implemented in phases, as with other components of the SFF.

Internationally, in 2006, Canada helped to build consensus for that year's UNGA Resolution on Sustainable Fisheries (61/105), which provided a roadmap to identify and protect vulnerable marine ecosystems (VMEs) as part of responsible fisheries management. In response to this Resolution, Canada has worked closely with other NAFO Contracting Parties to protect key VMEs in the NAFO Regulatory Area and to ensure the RFMO meets the requirements of the Resolution. Since 2006, NAFO has: closed 12 significant coral and sponge areas and five seamount areas to bottom fishing; implemented a protocol related to VME encounters and the exploration of pristine areas; and conducted interim assessments of the impact of current fishing practices on key vulnerable areas.

A permanent Working Group was also established to ensure that NAFO continues to have access to science and policy advice on VMEs. Canada has worked collaboratively with Spain and other NAFO partners to conduct extensive physical and biological surveys in the NAFO Regulatory Area to identify VMEs.

As a participant in the negotiations to establish a North Pacific RFMO, Canada continues to advance and support proposals that promote effective protection and conservation of VMEs which are consistent with domestic practices and building on lessons learned in other RFMOs, such as NAFO.

Government financial transfers

Total government financial transfers (GFTs) to the fisheries and aquaculture sector by Canada's federal government increased by 17% between 2007 and 2009 (Table 3.3). This increase is almost entirely attributable to two sets of general service expenditures: 1) a substantial two-year investment (in 2009 and 2010) in port infrastructure as part of a broad economic stimulus package; and 2) slight increases in management services. Direct payments remained essentially constant in this period, while cost-reducing transfers decreased significantly.

Table 3.3. **Government financial transfers to the fisheries and aquaculture sector by Canada's federal government, in millions of CAD**

Type of transfer	2007	2008	2009
Direct payments	290	290	296
Cost-reducing transfers	27	25	22
General services	455	476	577
Cost recovery charges	–44	–43	–44
Total	**728**	**748**	**851**

Canada initiated two GFT programmes in 2008 and 2009, both related to the lobster fisheries in Quebec and Atlantic Canada, which encountered significant difficulties during the global economic crisis that began in 2008. The first was the Short-Term Transitional Measures Programme, which provided limited support to low-income lobster fishers who encountered particular difficulty during the economic crisis and met a specific set of criteria with respect to their level of dependence on lobster for income. The programme ran for one year and ended in March 2010. The second programme is the Atlantic Lobster Sustainability Measures (ALSM), which supports industry-led projects aimed at improving both conservation and economic prosperity in the lobster fishery. The ALSM was initiated in 2009 and will operate for five years.

Post-harvesting policies and practices

Policy changes

In 2009, Canada designed and launched its catch certification system to fulfil European Union (EU) regulatory requirements to document that products being exported to the European Union do not originate from IUU fisheries. In collaboration with provincial governments and industry representatives, DFO developed a process for issuing the necessary EU catch certificates. This process includes DFO's Catch Certification Office (CCO),

opened in December 2009, and an online application system (the Fisheries Certificate System) that enables qualified applicants to acquire the required certificates promptly.

Markets and trade

Markets

Canadians' consumption of fish and seafood decreased slightly from 2007 through 2009. Apparent per capita annual consumption of fish products was 8.8 kg in 2007, but 7.8 kg in 2008 and 2009. This included decreases in consumption of fresh, frozen and processed marine fish, and shellfish, while consumption of freshwater fish remained approximately constant.

Trade

The volume and value of Canada's fish and seafood trade in 2007-09 is shown in Table 3.4. Exports decreased somewhat throughout the study period, largely because of the global economic crisis and the consequent decrease in demand for Canadian seafood products, many of which are luxury goods (*e.g.* lobster). Imports of fish and seafood increased by a small amount during these years, but at a rate quite similar to the rate of inflation.

Table 3.4. **Quantity and value of Canada's exports and imports of fish and seafood products**

Quantities in thousands of tonnes, values in millions of CAD

		2007	2008	2009
Exports	Quantity	670	632	603
	Value	3 880	3 884	3 636
Imports	Quantity	474	470	488
	Value	2 200	2 234	2 359

Policy changes

Bilateral trade agreements

In 2008 and 2009, progress was made on Canada's bilateral trade agreements agenda. A free trade agreement (FTA) between Canada and the European Free Trade Association (EFTA) countries of Iceland, Liechtenstein, Norway and Switzerland entered into force on 1 July 2009. The agreement provides duty-free access to Canadian and EFTA markets for all industrial goods and most fish and other marine products. The Canada-Peru FTA entered into force shortly thereafter, on 1 August 2009, which provides for eventual duty-free access for all Canadian fish and seafood products into that market. Canada also signed agreements with Colombia (21 November 2008) and Jordan (28 June 2009).

Negotiations toward a Canada-EU Comprehensive Economic and Trade Agreement (CETA) were launched at the Canada-European Union Summit on 6 May 2009 in Prague, with the first round taking place in October 2009 in Ottawa. The European Community is a priority market under Canada's Global Commerce Strategy, and the ambitious agreement, when realised, is expected to yield significant benefits for the economies of both Canada and the European Union. Additionally, Canada and India announced exploratory talks toward a Comprehensive Economic Partnership Agreement.

Canada continued its ongoing FTA negotiations with a number of trading partners, including meeting for a 13th round of negotiations with Korea.

Technical trade measures

Canada has been working since 2006 toward amendments of its Health of Animals Regulations and Reportable Diseases Regulations. This initiative has included extensive consultations with other levels of government, industry members and other stakeholders from 2006 to 2009. The proposed Regulations were pre-published in December 2009 in the *Canada Gazette*, and revised based on the resulting feedback. Other countries were consulted about the proposed Regulations, and Canada's trade partners were notified under the Committee on Sanitary and Phytosanitary Measures of the World Trade Organization in January 2010.

The amendments to the Regulations were approved in December 2010 and will become effective in December 2011. The revised Regulations will better control the import of aquatic animals and their products in order to prevent the introduction of disease, require the mandatory reporting of specified aquatic animal diseases, and establish a national framework that meets the international standards established by the World Organisation for Animal Health (OIE) in order to protect Canadian aquatic resources (wild and farmed) from serious infectious diseases and maintain markets for Canadian exports.

Outlook

The government of Canada indicated in 2010 that it would renew efforts to update the Fisheries Act, which was first enacted in 1868. While the Act has occasionally been amended, it has never been thoroughly revised to bring it up to date and to provide a more integrated legislative framework for fisheries management. A new Act would aim to provide a more predictable, stable and transparent fisheries and fish habitat management system where fish harvesters and others with an interest in fisheries can contribute to management.

Development and implementation of elements of the SFF will continue as noted above and, when combined with other efforts, such as the reorganisation of DFO to better reflect the importance of ecosystem considerations in fisheries management, will help provide for environmentally sustainable and economically prosperous fisheries.

Notes

1. More information on the SFF, including some of the specific policies noted below, is available at *www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/fish-ren-peche/sff-cpd/overview-cadre-eng.htm*.
2. A frontier area is defined as a marine ecosystem or area in water deeper than 2 000 m or in the Arctic where there is no history of commercial fishing and little if any information available concerning the benthic features and the impacts of fishing on these features.

PART III

Chapter 4

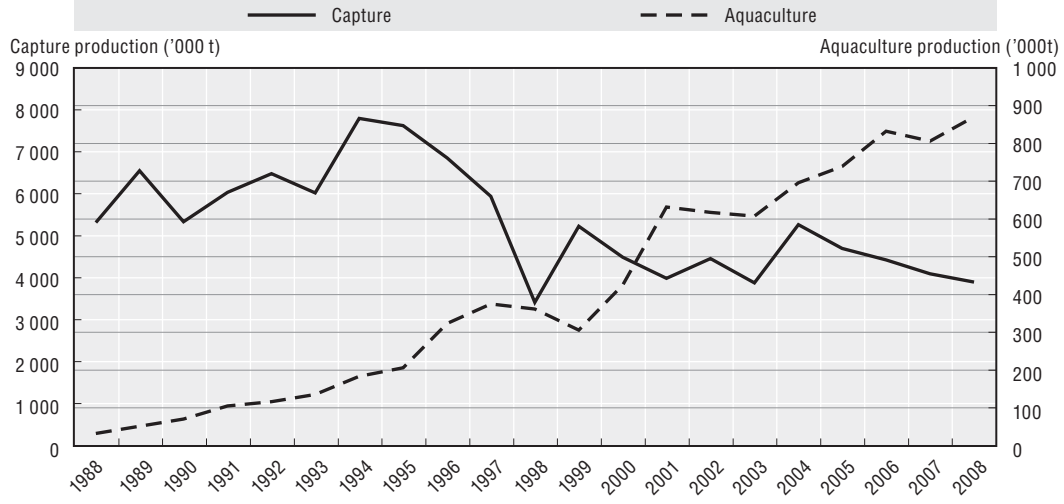
Chile

Chile

Summary of recent events

- Aquaculture has evolved to become the most important driver of development in the Chilean fisheries sector. It represented 39.2% of export value in 1997, increasing over time to reach 65.5% in 2008.
- A Coastal Area Zoning Programme is being implementation to improve policy coherence in coastal zone development and to facilitate co-ordinated action to prevent and combat diseases. The 2007 ISA outbreak had serious consequences on the Chilean salmon aquaculture sector.
- Chile participated in the negotiation process for the establishment of the South Pacific Regional Fisheries Management Organization (SPRFMO) which will manage high seas fishing resources in that area. The negotiation process was completed in November 2009 and ratification is expected to be processed by the Chilean Parliament.
- In January 2010, the Ministry for the Environment, the Environmental Assessment Service and the Superintendence for the Environment were created to establish a new institutional regime for environmental issues.

Harvesting and aquaculture production (tonnes)

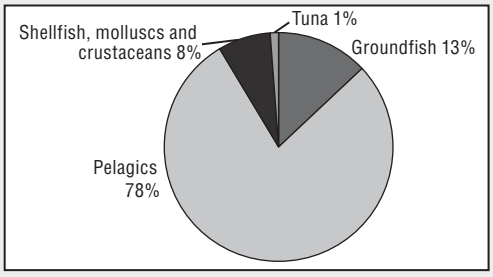


Source: FAO FishStat Database.

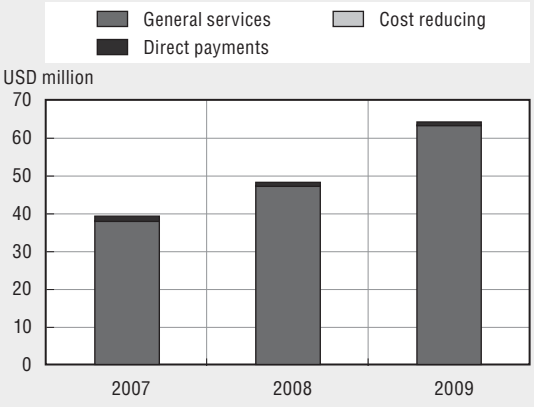
Key characteristics of the sector

- The total volume of the harvesting sector is the result of small-scale and industrial fish landings. In recent years, landings have decreased after reaching a peak in the mid-1990s to 3.4 million tonnes in 2009. Landed values decreased sharply in 2008 to USD 2.3 million from a recent high of USD 3.4 million in 2007, but have rebounded slightly to USD 2.4 million in 2009.
- Normally Chile does not provide any government financial transfers to the fisheries and aquaculture sectors. However, due to recent changed in quotas and emergencies in the aquaculture sector Chile has implemented special programmes for the reconversion of labour.
- Exports have grown considerably, in particular since 2000. Key export products are fish meal and salmon. Chile has signed 13 free trade agreements. Of particular importance are agreements with China and Japan, which represent key markets for fishery products.
- The 2007 National Fisheries and Aquaculture Census indicates that there is a total of 151 949 individuals employed in the fisheries and aquaculture sector. There were 3 823 individuals involved in the industrial fishing sector, in contrast with 71 880 in the small-scale fishery. Employees in processing plants accounted for an additional 56 652 individuals in 2007. The implementation of Maximum Catch Limits (MCL) led to a more efficient use of the resource, favouring higher capacity vessels in the industrial fleet.

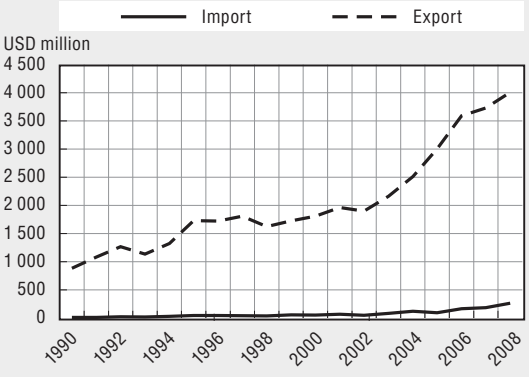
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD million)



Capacity

	2006	2008	% change
Number of fishers	68 602	79 072	15.3
Number of fish farmers	19 621	. .	. .
Total number of vessels	7 614	8 320	9.3
Total tonnage of the fleet	197 828	197 752	0.0

Institutional framework

The management of fisheries and aquaculture is under the jurisdiction of the central authority. The sector is regulated by the Undersecretariat for Fisheries, an agency that defines policies and the regulatory framework; the National Fisheries Service, that controls, monitors and surveillances the enforcement of the national fisheries and aquaculture regulation; and the Fisheries Development Agency, IFOP, a public-private institution that provides the information and analysis required to develop proposals and recommendations regarding the regulation and conservation of fishing resources and their ecosystems. Legislation also enables institutions such as the Police and the Chilean Navy to inspect and enforce fisheries and aquaculture regulations.

The fisheries and aquaculture industry in Chile is largely regulated by the General Law on Fisheries and Aquaculture No. 18892 (GLFA) and its amendments (latest in January 2010), as well as by other administrative acts. Since 1983, the sectors organisational structure has been regulated by DFL No. 5 of the Ministry of Economy, Development and Tourism (former Ministry of Economy, Development and Reconstruction).

The GLFA establishes that in order to obtain fishing authorisation as a natural person, a foreign individual should have a permanent residence visa in Chile. In the case of a juridical entity, it should be legally established in Chile; if foreign capital is involved, it should be proven that the investment was previously approved, when applicable.

Capture fisheries

Chile has a small-scale and an industrial capture fisheries sector. Since the mid-1990s landings have decreased to 3.4 million tonnes in 2009. Landed values decreased from a high of USD 3.4 million in 2007 to USD 2.3 million in 2008, rebounding slightly to USD 2.4 million in 2009.

Landings reflect a continuous decrease, mainly caused by the slowdown observed in landings of the industrial fleet, which registered 1.8 million tonnes in 2009. Landings of the small-scale fleet registered a relatively steady performance, with an average volume of around 1.4 million tonnes since 2006 (Table 4.1).

Table 4.1. **Total volume (t) landed, by fleet and fishery, 2006-09**

	Small-scale landings (t)				Industrial landings (t)			
	2006	2007	2008	2009	2006	2007	2008	2009
Fish	1 225 086	963 419	1 237 737	1 403 389	2 554 370	2 608 137	2 073 952	1 879 360
Mollusks	255 807	96 644	128 054	76 713	7 685	41 098	10 241	5 203
Crustaceans	9 721	9 470	12 730	11 413	7 595	8 102	9 331	11 457
Algae	13 130	13 090	16 281	19 104				
Others	24 319	23 079	24 766	24 519				
Total	**1 528 064**	**1 105 702**	**1 419 567**	**1 535 140**	**2 569 650**	**2 657 337**	**2 093 524**	**1 896 020**

Source: National Fisheries Service.

Table 4.2 shows revenue estimates per fleet and fishery for 2006-09 (first sale value).

Table 4.2. **Revenue per fleet ('000 USD/t) and fishery for first sale market ("beach price"), 2006-09**

	Small-scale fleet ('000 USD)				Industrial fleet ('000 USD)			
	2006	2007	2008	2009	2006	2007	2008	2009
Fish	520 887	481 000	355 209	616 697	2 237 099	2 861 620	1 808 065	1 678 504
Molluscs	60 214	45 281	52 582	42 507	1 374	10 807	2 760	1 154
Crustacean	19 274	17 940	24 868	20 239	8 075	11 290	21 146	17 727
Algae	5 274	4 104	4 814	7 543				
Others	17 096	15 147	17 567	15 969				
Total	**622 746**	**563 472**	**455 040**	**702 955**	**2 246 547**	**2 883 717**	**1 831 970**	**1 697 384**

Source: National Fisheries Service.

Management

Harvesting and access control measures apply to industrial fisheries while small-scale fisheries are regulated mainly through spatial allocation measures. Temporary and biological controls are common for both types of fisheries. Laws enable the implementation of management measures (Tables 4.3 and 4.4).

Table 4.3. **Fisheries management in tools in place of 2010 for the main national industrial fisheries: Pelagic, demersal and crustacean**

Type of control	Management measure	Legal instrument	Fishery in which the measure is implemented		
			Pelagic	Demersal	Crustacean
Harvest	Total Allowable Catch (TAC)	GLFA Art. 3 Letter c	Yes[1]	Yes	Yes
	Individual Transferable Quotas (ITQ)	GLFA Art. 39	Yes	Yes	Yes
	Maximum Catch Limit per Ship-owner (MCL)	Law 19.713 (O.G. 25/01/2001)	Yes	Yes	Yes
Access	Limitation to the number of vessels (industrial registry)	GLFA Art. 2, No. 40	Yes	Yes	Yes
	Restrictions to fishing nets	GLFA Art. 4 Letter b	Yes	Yes	Yes
	Restrictions to the fleet	GLFA Art. 2, No. 26	Yes	Yes	Yes
Biological	Minimum legal size	GLFA Art. 4 Letter a	Yes	Yes	Yes
Temporary	Biological ban	GLFA Art. 3 Letter a	Yes	Yes	Yes
	Extractive ban	GLFA Art. 48 Letter a	Yes	Yes	Yes
Spatial allocation	Fisheries exclusion zone	GLFA Art. 47	Yes	Yes	Yes

1. "Yes" means the Law is designed to be applied to that fishery.
Source: SERNAPESCA.

Table 4.4. **Authorised and operating fleet composition, according to GRT, 2006-09**

GRT range	2006		2007		2008		2009	
	Authorised	Operating	Authorised	Operating	Authorised	Operating	Authorised	Operating
> 1 500	9	9	9	9	9	9	11	11
1 000-1 500	22	22	21	21	23	22	21	21
500-1 000	92	56	86	61	82	54	79	57
< 500	172	114	165	112	164	102	152	98
Total	**295**	**201**	**281**	**203**	**278**	**187**	**263**	**187**

Table 4.5 provides an overview of the fish stock status in Chile.

Table 4.5. **Status of pelagic fishing stocks: significant variations in the status of commercially relevant fish stocks, as of 2010**

Fishery unit pelagic	Region	Fishing status as of 2006			Change in the status as of 2008-10		
		Status	S.S[1] biomass (t)	Year	Status	S.S biomass (t)	Year
Anchovy	XV, I-II	Spawning biomass over the pursued level	5 073 457	2006	Spawning biomass around to precautionary level[2]	1 943 000	2008
Anchovy	III-IV	Spawning biomass over the pursued level	437 000	2006	Spawning biomass around to precautionary level	275 000	2008
Anchovy	V-X	Spawning biomass over the pursued level	652 430	2006	Spawning biomass around to precautionary level	207	2008
South Pacific pilchard	XV, I-II	Very low catch level	Not assessed	2006	Spawning biomass reduced by climatic conditions	Not assessed	2010
South Pacific pilchard	III-IV	Reduced spawning biomass (climate factors)	Not assessed	2006	Spawning biomass reduced by climatic conditions	Not assessed	2010
Common sardine	V-X	Spawning biomass over the pursued level	1 791 200	2006	Maintained status	16 820 003	2008
Chilean jack mackerel	XV,I-X	Stable spawning biomass, lower than the pursued level	4 000 000	2006	Spawning biomass below the pursued level	2 200 000	2009

1. Spawning stock biomass.
2. Highly uncertain estimates, as the stock is shared with Peru to a great extent.
3. Highly uncertain estimates.

Foreign fleet access

Foreign vessels are not allowed to operate in waters under the Chilean jurisdiction (art. 17 and 44, GLFA). The same applies to foreign small-scale fishermen (art. 51, GLFA). The operation of foreign flag fishing vessels is also forbidden (art. 115, GLFA). Nevertheless, legislation allows foreign vessels to undertake scientific research, allowing exceptional[1] fishing for short periods on specified resources.

Management of recreational fishing

The Law on Recreational Fishing (Law No. 20256) has been in place since 2008. It provides definitions and conditions that regulate this activity in Chile, establishing the authorised fishing nets and catch limits. There are four regulations (Table 4.6) contained in this Law which are currently implemented.

The Regulation on Management Areas (TURF) was modified (S.D. No. 49-2/Feb/2009 and its amendments in Law No. 20.437), providing flexibility to the procedures to maintain the TURFs. Additionally, new legislation has been implemented with the aim to decentralise fisheries management by moving the administration to Zonal Directors (authorities having specific competences in one or more regions) [Law on Recreational Fishing, No. 20.256., Art. 60 (2008)].

Table 4.6. **Regulation related to recreational fishing**

No.	Regulation	Rule	Purpose
1	Regulation on restocking and stocking for purposes of recreational fishing	S.D. No. 210 as of 2009	Regulates and determines the way to stock and restock with recreational and touristic purposes.
2	Regional council on recreational fishing	S.D No. 138 as of 2009	Regional councils on recreational fishing are created, promoting the de-concentration of fisheries management and regulating the entrance and leaving of Counsellors for recreational fishing.
3	Recreational fishing gears and nets	Under procedure	A regulation is under development for fishing gears and nets authorised in recreational fishing.
4	Recreational fishing in TURFs (or management areas)	Under procedure	A regulation is under development, for the catch of species in recreational fishing and underwater hunting within TURFs, which are spaces oriented at the management of benthic resources by small-scale fishing organisations.

In addition, the Undersecretariat for Fisheries is promoting and collaborating with conservation measures focused on:

- creating and implementing national action plans to reduce the mortality of seabirds and sharks;
- implementation of the Agreement on the Conservation of Albatross and Petrels;
- developing guidelines for the conservation of native species;
- elaborating declaration of zones, in accordance with the Regulation on Hydrobiological Pests (S.D. No. 345/2005);
- promoting the establishment of Marine Protected Areas; and
- designing management plans for marine mammals.

Fisheries for indigenous peoples

In early 2008, Law 20249 that created Marine Coastal Spaces for Indigenous Peoples was enacted. The related regulation was published in 2009. The regulation safeguards determined spaces for indigenous communities in order to maintain their consuetudinary use[2] and traditions (religious, recreational, fishing, medicinal and other uses). As of July 2010, there are nine requests for marine coastal spaces for indigenous peoples for the IX, XIV and X Regions, under different levels of procedure.

Territorial use right fisheries (Management Areas, AMERB)

As of May 2010, 19 indigenous associations hold 32 management areas, distributed in three regions (VIII, XIV and X), covering around 4 000 ha; each area reaching an average 142.9 ha. (from 5.5 ha to 895 ha). The main resource harvested in these areas is Chilean abalone, locally known as *Loco*.

Monitoring and inspection

According to the fishing regulation regarding monitoring, control and surveillance,[3] industrial and small-scale capture fisheries, whether with or without vessels, are subject to the following obligations.

Conditions for the exercise of activity

Fishing authorisation (art. 15, 47, 50, GLFA). Industrial: vessels must have a fishing authorisation to conduct their activities. The authorisation specifies the species, the area and the gear, for an indefinite period.

Small-scale: open access fishery. There is no specific authorisation, but registration is mandatory. A five nautical mile coastal area is reserved for small-scale fisheries, measured from the normal baselines, from the northern limit of the Republic up to parallel 41° 28,6'S, as well as internal waters south to that last point.

National registry of fishing vessels (art. 41, GLFA). Industrial: the registration of vessels enables them to operate. Only vessels registered in Chile and flying national flag may be registered with the National Fisheries Service. Any modification to the fishing authorisation has to be reported.

Small-scale: fishermen and their vessels have to be registered in the Small-scale Fishing Registry kept by the National Fisheries Service. The registration classifies data by region and species and has four categories (ship owners and their vessels, crew, shellfish diving collectors and beach resources collectors).

Accreditation of operation areas (art. 64b, GLFA). In industrial fisheries vessels registered in Chile and fishing in or beyond jurisdictional waters, as well as industrial vessels conducting research activities, whether registered in Chile or not; and fishing or factory vessels flying foreign flag, authorised to berth at Chilean ports, have the obligation to install and maintain a satellite positioning device onboard to determine whether the vessel operates in an authorised area. Registered information is confidential and managed by the National Directorate of Maritime Territory of the Chilean Navy and by the National Fisheries Service. In small-scale fisheries there is no obligation to use an automatic-register satellite-positioning device at sea.

Reporting catch and landings (art. 63, GLFA). Industrial: ship owners conducting any type of fishing activities shall inform the National Fisheries Service about species and fishing ground of catches and landings. The obligation to inform applies to any national or foreign fishing vessel berthing at Chilean ports all, or a part of catches. Besides, at landing a catch traceability process starts until the product reaches the market.

Small-scale: ship owners shall inform the National Fisheries Service about species and fishing ground of their catches and landings.

Certification and verification of landings (art. 10, Law 19.713). Industrial: all catch information per fishing trip shall be certified at landing. With this provision, 100% of industrial landings are audited and certified by volume and by composition of landed species.

Small-scale: It is not obligatory to certify catch information at landing; however, in the main fisheries (constituting about 70% of the resources landed by the small-scale fleet), landings are verified in the way and under the conditions established by the Service.

Processing authorisation (D.F.L. No. 5 as of 1980, and S.D. No. 175, 1980). All processing plants shall have an authorisation from the Undersecretariat for Fisheries. They have the obligation to inform the Service about the origin of their supply, both industrial and small

scale, as well as about the final products. This information is part of the traceability process started at landing.

Accrediting movement of catch and derived products. The movement of fisheries products shall be notified establishing whether the product has a legal origin. This information is part of the traceability process started at landing.

Accrediting legal origin of export products. Previous to export, stakeholders should accredit the origin of the product to be exported. The product has to be traced from landing of the resource all the way to the moment of export.

Agreements and multilateral arrangements. Table 4.7 lists all arrangements.

Table 4.7. **Conventions and agreements ratified by Chile during 2006-10**

Subject	Regulation	Publication
Promulgates Amendments to the International Convention for the Safety of Life at Sea, 1974 (SOLAS 1974), amended, and its 1988 Protocol.	Decree No. 8	30 April 2010
Promulgates Agreement on the Privileges and Immunities of the International Tribunal for the Law of the Sea.	Decree No. 184	31 December 2007
Promulgates amendments to the Convention Text of the International Maritime Organization, published in the Official Gazette as of 20th April 1972.	Decree No. 296	6 December 2006

During 2006-09, Chile participated in the negotiation process for the establishment of the South Pacific Regional Fisheries Management Organization (SPRFMO) which will manage high seas fishing resources in that area. The negotiation process was completed in November 2009. In January 2010, Chile attended the signing process and ratification is expected to be processed by Parliament soon. The SPRFMO negotiation framework specifies interim measures for pelagic and bottom fisheries.

The 2007 interim measure established a first freezing of effort in terms of number of vessels and GRT. Regardless of this, participants with a catch history in the pelagic fisheries in the South Pacific but not exercising their activities in 2007 were given the chance to enter the fishery until 2009. This measure also established the obligation to provide information and gave the Interim Scientific Working Group of the SPRFMO a mandate to assess the exploitation status of the main resource, Chilean jack mackerel.

In 2009, the pelagic interim measure was renewed, establishing new limits for vessel accession and GRT and increasing commitments with regard to reporting, monitoring, control and surveillance.

The 2007 interim measure established fishing effort limitations for bottom fishing activities that may impact vulnerable marine ecosystems (VMEs). The measure establishes a procedure to assess impacts of these activities on VMEs and allows developing fishing activities as long as their impacts are prevented.

Aquaculture

During the first semester of 2007, the ISA virus was detected in farms of the X Region, causing a crisis in the salmon farming sector, which led to sacrificing significant levels of production and accelerating planned harvests. As a result, less production and employment were registered in 2009.

With a view to achieving harmonious and integrated coastal area development in accordance with the National Policy for the Use of the Coastal Fringe (1994) a Coastal Area Zoning Programme for each coastal region of the country is implemented. In this context the Appropriate Areas for the Development of Aquaculture and the installation of farms shall be adapted to provisions contained in these programmes, in accordance with the amendment introduced by Law 20434 (2010).

Currently there are two regions that have completed the zoning process (Regions XI and IV); Region VIII is expected to complete the process soon. The other regions are undergoing the process and are part of an agreement between the Undersecretariat for Regional Development, the Regional Governments and the Undersecretariat for the Armed Forces (formerly Undersecretariat for Marine Affairs). The latter establishes control of the advances of the zoning process through a mandate given by the National Policy for the use of the coastal fringe (*www.bordecostero.cl*).

As a result of the XI Region zoning, the Areas Authorized for the Development of Aquaculture were modified (S.D Undersecretariat for the Armed Forces No. 252 as of 2009).

Law 20434 amending the GLFA in terms of aquaculture was published in the Official Gazette in April 2010. Its regulations are under development and consider the following aspects:

- Conditions and procedures for the use of antimicrobials, vaccines, chemicals and waste treatment for: 1) establishment of concession groups; 2) conditions to be complied with by freshwater and marine fish farms; and 3) reports to be periodically submitted by the holders.
- Densities/ha for concession groups, by species or group of species.

From April 2011 on, the Service shall publish, each semester, on its website, information regarding operating conditions of farms, including: *a)* sanitary information and antimicrobial use per quantity and type of groups; *b)* reports of the National Programme for Surveillance of High-Risk Disease; *c)* results of environmental reports; and *d)* sanitary zoning regarding regulation, indicating free, infected, and monitored zones.

According to data analysed by the Undersecretariat for Fisheries (Table 4.8) there are 3 229 aquaculture concessions, covering 31 859 ha. Production data for 2006-09 is specified in Table 4.9, and Table 4.10 lists export values.

Table 4.8. **Concessions per type of farming by year**

	Mollusks	Salmons	Algae	Other[1]
No. of Concessions	1 259	1 191	649	94
Surface covered (ha)	16 499	12 419	2 211	730

1. Includes other farmed species (other than salmon), non-traditional or non-specified species.

Table 4.9. **Aquaculture production (t), 2006-09**

Species	2006	2007	2008	2009
Atlantic salmon	376 476	321 254	388 847	203 067
Coho salmon	118 221	77 900	92 317	133 308
King salmon	1 958	2 061	72	596
Rainbow trout	150 608	177 750	149 411	149 741
Channel catfish			3	
Hirame	9		3	
Turbot	268		279	
Abalone	395	362	515	899
Blue mussel	126 952	157.936	187 064	167 876
Giant mussel	617	860	1 575	2 021
Mussel	896	590	692	710
Scallop	19 426	57.670	21 277	16 680
Patagonian scallop				14
Oyster	152	162	205	150
Pacific oyster	1 443	1.054	882	100
Spirulina	3 189	8	6 000	100
Giant kelp			1	3
Haematococcus	1 444		16	
Gracilaria seaweed	33 586	20 437	21 686	21 580
Total	**835 679**	**818 045**	**870 845**	**696 846**

Source: National Fisheries Service; Annual Fisheries Statistics.

Table 4.10. **Total exports of aquaculture in value and volume, 2006-09**

Product/item	Value (USD «000)				Volume (tonnes)			
	2006	2007	2008	2009	2006	2007	2008	2009
Atlantic salmon	1 425 532	1 434 106	1 497 010	1 085 392	215 247	206 266	232 316	181 966
Rainbow trout	482 823	523 443	594 010	593 458	93 274	111 058	124 827	98 822
Coho salmon	293 865	280 500	298 849	421 523	78 451	78 442	88 536	89 797
Unspecified salmon	60 892	81 635	100 430	67 895	77 378	101 324	100 334	82 210
King salmon	7 125	6 500	386	1 675	1 414	1 280	72	469
Brown trout	1 340			1 035	221			229
Blue mussel	64 379	85 849	131 882	94 361	27 104	35 011	45 499	38 572
Abalone	7 780	6 092	7 976	14 136	322	257	331	555
Scallop	29 495	21 805	33 212	20 656	1 933	2 140	2 922	2 481
Gracilaria	49 500	49 072	40 887	34 442	4 137	3 642	3 284	2 952
Turbot	2 391	3 164	2 370	2 418	201	280	259	254
Pacific oyster	1 961	1 394	1 734	824	707	468	607	386
Total	**2 427 083**	**2 493 559**	**2 708 747**	**2 337 814**	**500 389**	**540 167**	**598 987**	**498 693**

Note: For Atlantic salmon, the decrease in volume harvested is explained by the effects of ISA virus. This is the main farmed salmonid species.

Fisheries and the environment

The General Environmental Law and the Environmental Regulation for Aquaculture establish that aquaculture projects are subject to the Environmental Impact Assessment (EIA) system. When an EIA is not required, environmental information about the planned area shall be submitted. Information about the environmental conditions allows for carrying out follow-up and taking measures when anaerobic conditions are detected more than once. Measures to be taken include obligatory fallowing of farms, sanctions and even the revoking of licence when applicable.

The Regulation on Measures to Protect, Control and Eradicate High-Risk Disease that affect Hydrobiological Species establishes requirements to mitigate the effects of escapes or introduction of exotic species as well as the appropriate disposal of dead specimens. The following national regulations are intended to safeguard the ecosystem:

S.D. (MINECON) No. 86 (2007), amends S.D. (MINECON) No. 320 (2001):

- minimum distance between the bottom and farming structures;
- facilities and conditions for net transfer and washing. In sea based farms nets not impregnated or not coated with antifouling shall be washed *in situ;*
- establishment of categories that define requirements to elaborate Preliminary Site Description and Environmental Information (EI); and
- environmental permits as part of the requirements to obtain an environmental qualification in the EIA system shall only be granted when sediment conditions are aerobic.

S.D. (MINECON) No. 397 (2008), modifying S.D. (MINECON) No. 320 (2001) (www.subpesca.cl):

- definition of production; specifies elements mentioned in S.D. (MINECON) No. 86 (2007) and establishes that farming modules shall adopt appropriate safety conditions, according to geographic and oceanographic conditions, requiring annual certification;
- specifies and improves the methodology for environmental samplings, classified by type of farming;
- establishes that farms are required to fallow when environmental conditions are anaerobic; and
- requires the analysis of PSD and EI to be conducted by qualified individuals, in certified laboratories, under the Chilean standard ISO 17.025, or the applicable standard.

Other relevant environmental regulation in terms of aquaculture, revised every five years:

- S.D. No. 90 (2001) of the Ministry General Secretariat of the Presidency: to prevent pollution of marine and continental surface waters, through controlling pollutants related to liquid waste discharged into surface continental, lake and marine water bodies (currently under public consultation, *www.conama.cl*);
- S.D. No. 146 of the Ministry General Secretariat of the Presidency that regulates the emission of fluids generated by stationary sources, establishing maximum allowable limits, according to the zone in which the receptor is located (currently under public consultation, *www.conama.cl*).

Regarding environmental policies and fisheries, recent management measures include:

- the National Plan for the Conservation of Sharks of the Undersecretariat for Fisheries, which constitutes a concrete step taken to mitigate adverse impacts of fishing on *Chondrichthyes* fisheries;
- the National Plan of Action to Reduce Incidental Catch of Seabirds in Longline Fisheries (PAN-AM/CHILE); and
- Law No. 20.293 (2008) to protect cetaceans (modifies Law 18892, updated April 2008).

Initiatives for sustainable development:

- the Undersecretariat for Fisheries has signed an Advisory Agreement (Integrated Assistance for Decision Making in Fisheries and Aquaculture, 2010, Res. No. 06-28/Jan/2010), with the Fisheries Development Agency (IFOP) to implement the Ecosystem Approach;
- sustainability is addressed by actions contained in the National Aquaculture Policy, promulgated by S.D. (MINECON) No. 125 (2003), implemented by the National Aquaculture Commission;
- S.D. No. 81/2009 permanently prohibits the catch of *Rhincodon typus*, *Carcharodon carcharias* and *Cetorhinus maximus* whose status is under great threat in compliance with the Convention for the Conservation of Migratory Species of Wild Animals, signed by Chile in 1981;
- S.D. No. 179 (2008) prohibits the catch of cetaceans. Law 20293 (2008) establishes that waters under Chilean jurisdiction constitute a cetacean sanctuary; and
- dialogue and working groups have been set to ensure the appropriate management of demersal and benthic fisheries. Their purpose is to reach consensus and validate economically and socially relevant national decisions with fisheries users. Representatives of the different sectors involved in the management, inspection and use of fishing resources participate in this instance (Table 4.11).

Table 4.11. **Public-private dialogue groups on fisheries**

Demersal fisheries	Benthic fisheries
Southern hake	Sea urchin
Chilean hake	Brown seaweed
Golden kingclip	Clam
Skate	Small Chilean clam
	Pink clam

Scientific committees constitute platforms for collaboration in decision-making processes related to the management and regulation of fisheries and aquaculture. They are composed of experts and scientists from the public and the private sector. Results or recommendations are submitted to the appropriate decision-making instance. This has served to ensure the formal participation of scientists and experts in determining the conservation status of resources and in the evaluation of fisheries regulation measures. Improving the decision-making processes is pursued, as well as strengthening the legitimacy and representation of adopted measures.

A conservation plan for the Chilean hake fishery is being implemented to ensure permanent revision of management measures. It combines conservation and sustainability aspects, defining specific regulations based on performance indicators. To achieve advances in this Plan, the Scientific Committee on the Chilean hake fishery was convened with a first session in June 2008.

The first Fisheries and Aquaculture Census was conducted, covering the small-scale, industrial, aquaculture sectors and their sub-sectors. This is expected to have a positive impact on the future planning of public actions, regulations and policies. A total of CLP 2 000 million were allocated to this project. The agencies involved are the Undersecretariat for Fisheries and the National Statistics Agency.

The National Commission for the Use of the Coastal Fringe was created as part of the public-private instances to develop policies relating to zoning of the coast, implementing methodologies focused on the public-private agreements, in the framework of the Integrated Management of Coastal Areas.

New institutional regime for environmental issues

Law 20417 was promulgated in January 2010, creating the Ministry for the Environment, the Environmental Assessment Service and the Superintendence for the Environment to develop guidelines and regulations for the protection of environmental resources, thus managing competences and facilitating public inter-institutional coordination.

Besides improving the EIA system, a Strategic Environmental Assessment is created to incorporate environmental considerations of sustainable development into policies and plans. The objective is to anticipate adverse environmental effects of a specific policy or plan. The prevention or mitigation of such effects or mechanisms is considered to avoid the generation of cumulative environmental effects.

Law 20417 also creates a National System of Wild Protected Areas, which includes Marine Parks and Reserves, and the Marine Coastal Protected Areas for Multiple Uses.

Sanitary considerations

S.D. (MINECON) No. 416 (2008) modifies the sanitary regulation for high-risk diseases. It establishes new minimum standards for farms and service providers in aquaculture.

The concept of Bay Management Areas (coordinated sanitary management areas) was created. This entitles the authorities to form concession groups and to impose coordinated sanitary measure. The concept of sanitary emergency was introduced. The obligation to monitor prevalent disease was established. Besides, hatcheries were introduced, protecting them at a sanitary level, with higher distance levels from other farms. There is also the possibility to ensile dead fish to prevent disease from spreading.

S.D. (MINECON) No. 208 (2009): Measures related to the use of antimicrobials in aquaculture were introduced to the sanitary regulation as was the obligation to notify the use of vaccines, antimicrobials and other type of therapeutically treatments and their results. The National Fisheries Service shall annually issue a public report on the use of antimicrobials in aquaculture and other sanitary measures.

The Fisheries Research Fund (FRF) has conducted some research on the impact of abalone farming in the north and south of Chile and farming has been authorised in the northern zone in determined bays, requiring monosex individuals.

Governmental financial transfers

As a general policy, the Chilean Government does not provide any subsidies to the aquaculture and fisheries sector. Nevertheless, during this period, it has undertaken special programmes, as a consequence of the process of labour reconversion of former fishermen and other particular situations.

In 2002, Law No. 19.849 created a special fund (Fishing Administration Fund) to progress the fishing administration, capacity building, social support and retraining of former fishermen who lost their work as a consequence of the Law of Maximum Catch Limit (Table 4.12), in particular small-scale fishers (Table 4.13).

Table 4.12. **Social support for displaced workers of the industrial fishing sector (former crew members)**

	Total amount (USD)
2006	67 323
2007	893 215
2008	139 915
2009	195 851
2010	287 254

Table 4.13. **Social support for small-scale fishermen (USD)**

	Total investment	Economic support for crisis of the sector	Study scholarships for fishermen's children
2007	435 154	283 567	151 588
2008	969 079	903 811	65 268
2009	769 464	233 734	535 730

Table 4.14. **Government financial transfers (USD)**

Nature	2006	2007	2008	2009
Support to market prices	No policy of price modification			
Direct payment				
Support to small-scale fishermen[1]	4 730 518	4 752 013	10 162 144	15 750 387
Transfers for cost reduction	There is no policy to help reduce the costs of operations of fishermen. Nevertheless, small-scale fishers do not pay for port use; there is no registry to value this indirect transfer			
General services				
Fisheries management, research, monitoring, control and surveillance	28 634 680	38 030 821	47 237 783	63 432 274
Total	**33 365 198**	**42 782 833**	**57 399 927**	**79 182 661**

1. In 1991, the GLFA established the Small Fishery Encourge Fund (FFOPA) with the objective of promoting the sustainable development of the small-scale fishing sector and supporting inicitives of fisherman to improve their condition of work and life.

Post-harvesting policies and practices

Food safety

The National Fisheries Service is responsible for the certification of export products, using the Hazard Analysis Critical Control Point (HACCP) adopted by the Codex Alimentarius Commission. This allows identifying specific hazards and measures to ensure food safety. However, for domestic commercialisation purposes, the Ministry of Public Health is responsible for implementing the Regulation on Food Health in order to ensure food safety. There are no specific domestic laws or regulations focused on fisheries products for export. Requirements to ensure sanitary quality of export products are contained in the Fishing Safety Manual (based on the GLFA, Art. 122b).

The Ministry General Secretariat of the Presidency issued Decree No. 83/2005, creating a presidential advisory commission (Chilean Agency for Food Safety) which is composed of representatives of different Ministries, including the Undersecretariat for Fisheries. The Agency advises the President in the identification, elaboration and implementation of policies,

plans, programmes, measures and other activities related to food safety, develops a national food safety system and coordinates the interaction of institutions involved in this issue.

In 2009, the National Policy on Food Safety was promulgated. It is aimed to "ensure the safety of food produced, elaborated and commercialised in the country, in order to protect people's health and the rights of consumers, as well as favouring the competiveness and export development of the food industry, through a modern integrated, efficient, and transparent national food safety system" (*www.achipia.cl*, Table 4.15).

Table 4.15. **Objectives and guidelines of the national policy on food safey**

Objectives	Guidelines
Regulatory framework	Having a harmonised regulatory framework, or equivalent, containing the international regulation of the *Codex Alimentarius*. Strengthening national presence in international instances.
Scientific and technological capacities	Increasing and improving human capital capacities. Strengthening research and innovation. Strengthening the analytical capacity of the laboratory network.
Control and surveillance system	Widening and consolidating practices and mechanisms of food hazard self-control. Strengthening and improving food control and hygiene programmes. Developing a consistent and efficient and integrated system of safety information. Modernising the management of food alert.
Food export and import	Improving control and certification processes regarding export-oriented food safety. Improving procedures for authorisation of food import.
Food industry and self-control practices	Favouring the improvement of technical and operating capacities of companies in terms of safety. Upgrading and widening development instruments for small and medium scale companies.
Public institutions and participation	Modernising public institutions regarding food safety. Widening and improving mechanisms of participation and communication of the risks.

Currently, case studies for certification involving food safety have been developed for:

- Blue Mussel of Chile (*Mytilus chilensis*) certified by Friend of the Sea. And
- Chilean Hake (*Merluccius gayi gayi*) pre-certified by Marine Stewardship Council (MSC).

The Fishing Safety Manual contains a technical traceability standard.

Chile supports labelling initiatives consistent with FAO technical standards, that is voluntary, transparent, and non-discriminatory instruments that promote sustainable fisheries.

Tables 4.16 and 4.17 illustrate Chile's processing capacities.

Market and trade

Data provided by the *Calidad de Vida* Survey (2006) conducted by the Ministry of National Health indicate that 58% of the population never consumes fish and only 11% does twice a week. Different government and non-governmental institutions have made efforts to increase seafood consumption. However, just a few private-public initiatives have been undertaken in order to increase consumption of seafood at early ages or to promote the benefits of some products such as the Giant Squid, which is abundant on the coasts of Chile, but sold at a reduced price due to low acceptance in the local market. The low level of fish consumption is a result of different factors, such as:

- the lack of fresh fish in different sale points that are nonetheless equipped with a cold chain;
- the lack of low price products, or at least at the price level of meats;
- lack of background in the consumption of these products;
- preference for fast (junk)food;

Table 4.16. **Transformed raw materials and final products ('000 tonnes), 2004-08**

		Fresh-refrigerated	Frozen	Canned	Salted dry and moist	Algae products	Fishmeal	Fish oil	Others	Total
Raw material	2004	264.5	841.3	357.6	8.1	407.3	3 871.6	0.0	10.5	5 760.8
	2005	318.4	850.6	343.2	4.2	423.2	3 317.0	0.0	13.0	5 269.6
	2006	319.8	942.9	437.1	3.0	335.5	3 075.0	0.0	0.1	5 113.4
	2007	293.8	885.0	346.0	3.2	331.2	2 933.5	0.0	0.0	4 792.8
	2008	324.6	798.1	201.8	2.0	409.9	2 926.8	0.0	0.0	4 663.3
% of the total	2004	4.6%	14.6%	6.2%	0.1%	7.1%	67.2%	0.0%	0.2%	100.0%
	2005	6.0%	16.1%	6.5%	0.1%	8.0%	62.9%	0.0%	0.2%	100.0%
	2006	6.3%	18.4%	8.5%	0.1%	6.6%	60.1%	0.0%	0.0%	100.0%
	2007	6.1%	18.5%	7.2%	0.1%	6.9%	61.2%	0.0%	0.0%	100.0%
	2008	7.0%	17.1%	4.3%	0.0%	8.8%	62.8%	0.0%	0.0%	100.0%
Total production	2004	178.4	455.9	126.8	5.1	54.2	1 020.2	197.6	5.5	2 043.7
	2005	215.1	491.4	117.9	3.0	60.7	867.7	171.2	7.4	1 934.3
	2006	279.5	515.3	101.7	2.2	65.8	851.5	180.2	1.9	1 998.1
	2007	260.5	578.7	121.4	2.7	60.1	788.9	180.1	1.5	1 993.7
	2008	312.4	564.3	88.7	1.7	82.3	754.3	193.3	1.7	1 998.7
% of the total	2004	8.7%	22.3%	6.2%	0.3%	2.7%	49.9%	9.7%	0.3%	100.0%
	2005	11.1%	25.4%	6.1%	0.2%	3.1%	44.9%	8.8%	0.4%	100.0%
	2006	14.0%	25.8%	5.1%	0.1%	3.3%	42.6%	9.0%	0.1%	100.0%
	2007	13.1%	29.0%	6.1%	0.1%	3.0%	39.6%	9.0%	0.1%	100.0%
	2008	15.6%	28.2%	4.4%	0.1%	4.1%	37.7%	9.7%	0.1%	100.0%

Source: National Fisheries Service.

Table 4.17. **Number of transformation plants per geographic area,[1] 2006-08**

	North	Center	South	Southernmost area	**General total**
2006	154	45	226	56	**481**
2007	148	40	222	48	**458**
2008	154	45	236	47	**482**

1. North: Regions I-IV and XV; Center: Regions V-VII, including the Metropolitan Region; South: Regions VIII-X and XIV; Southernmost area: Regions XI and XII.

Source: National Fisheries Service.

- lack of fish consumption habits; and
- no large-scale campaign to attract consumers. The last national campaign to increase fish consumption was conducted in 1971-72 which promoted Chilean hake.

The strategic purpose of the fisheries and aquaculture institutions (Undersecretariat for Fisheries, National Fisheries Service, Fisheries Development Agency) is to pursue the economic development of the sector in a sustainable and equitable way. Promoting fishing products in national and international markets is mostly a responsibility of fish and shellfish producers.

The agency in charge of exports development (ProChile) has special plans for seafood, for example:

- positioning Chile as a safe and reliable provider of high-quality seafood, committed to the sustainable fisheries and aquaculture resources; and

- diversifying exports of seafood through surveying new markets and niches within the current framework of international competitiveness.

75% of fisheries and aquaculture production is exported, both in value and volume. Since 2000, the aquaculture activity surpassed fisheries in terms of contribution to exports. In 2009, aquaculture represented 62% of the total exports.

The total value of exports in 2009 was USD 3 797 million and the volume was 1.4 million tonnes. This means a 7.6% fall in export value and a 5.6% increase in volume with regard to 2008. This is a result of two facts: domestic fish meal demand decreased due to the ISA virus, generating a surplus in the volume of this commodity for export. The decreasing export value is explained by the drop in production of fresh, chilled and frozen products (27.5% and 7.5% decrease respectively).

During 2009, Chile exported to 122 markets; nine of them represent 79% of the exported value and 70% of the volume. Japan, the United States and China are the most important markets, representing 27.3, 18.5, and 11.3% of the exported value, respectively.

Since 2006, Chile has signed 13 commercial agreements. The most important ones in terms of type of agreement and markets involved are with China and Japan. These countries represented, during 2009, almost 40% of the value of national fisheries and aquaculture exports.

The main product exported to China is fish meal (75% of the total value to that market), followed by salmon, which is custom duty free. For the Japanese market, frozen products are the most relevant (salmon and trout), whose current custom duty is 3.5%; they are included in the goods to be negotiated by the fifth year of implementation of the Free Trade Agreement (2012).

Chile currently participates in a FAO Latin American project called *Asistencia para el Diseño y/o Fortalecimiento de Políticas de Inocuidad de Alimentos para los Países de la Región*. It started in March 2010 and will last 18 months. The national counterpart is the Ministry of Agriculture and the National Agency for Food Safety. The project activities include the following:

- diagnosing and assessment of performance of the current food control system; indentifying needs for strengthening and prioritisation of strategies for the implementation of an agreed plan of action, according to the political view of safety;
- elaborating national plans of action for safety and strategy control systems;
- designing and submitting economic indicators and criteria, essential to assess the impact of food safety in each country;
- training professionals and people responsible for implementing and managing food control systems for each country, of the different public and private sectors, through conducting five regional and three national workshops;
- elaborating an effective communication strategy and campaign on safety, in each country, based on transparency, knowledge, and participation at different levels (*e.g.* local, decision makers, national authorities).

Notes

1. Article 102, paragraph 3. Notwithstanding provisions contained in article 161 of this Law, the operation of foreign flag vessels may be authorised for the purposes of research fishing, subject to celebrating a contract with national ship-owners, pr public or private Chilean organisms. They shall comply with provisions contained in this Law, as well as with those giving attributions to the maritime authority.
2. Consuetudinary use is understood as the customary practices and behaviors of members of communities or community associations, accordingly, which are recognised collectively as an expression of their culture.
3. S.D. No. 175/1980 regulates fishing activities and D.F.L. No. 5 as of 1983 sets the drafted, coordinated and systematised text of D.F.L. No. 34, as of 1931; S.D. No. 430, as of 1991, GLFA and its amendments; Law No. 19.521 establishes the obligation to install a VMS device onboard of fishing vessels; Law No. 19.713 establishes the obligation to certify landing information.

PART III

Chapter 5

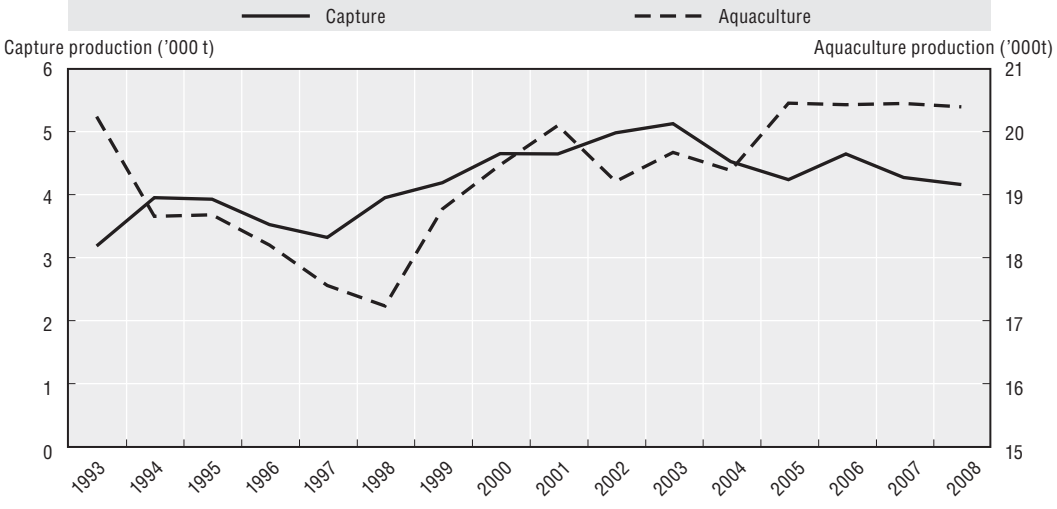
Czech Republic

Czech Republic

Summary of recent developments

- Pond aquaculture is the most common production method in the Czech Republic. It is practiced in man-made water bodies situated primarily in rural areas.
- Fishponds fulfil other non-productive functions in their regions, such as water retention, flood protection and biological cleaning of water. They also provide artificially created areas for bird nesting and protected territories for animals; they fulfil recreational as well as eco-stabilisation functions and contribute to preserving biodiversity.
- Management consists primarily in the maintenance of river systems and the up-keeping of fishing populations in locations where recreational fishing is takes place. Some 350 000 fishers participate in recreational fishing.

Harvesting and aquaculture production (tonnes)

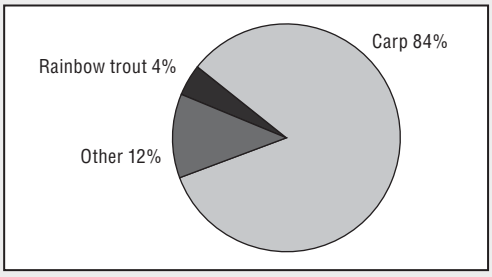


Source: FAO FishStat Database.

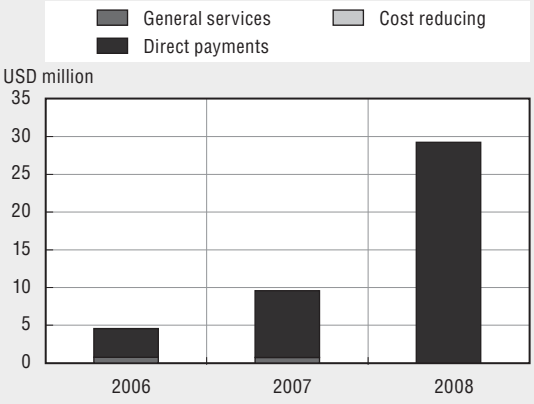
Key characteristics of the sector

- The Czech fisheries production originates almost exclusively from aquaculture, with carp by far the most important species. Carp production in 2008 was more than 17 000 tonnes.
- In addition to carp and trout, Czech aquaculture produces pike, tench, pikeperch, catfish and perch.
- The Czech Republic gained access to the European Fisheries Fund (EFF) when it obtained EU membership in 2004.
- Available data for 2006-07 shows a higher trend in direct payments. Fund availability for aquaculture for the period 2007-13 totals EUR 36.14 million, EUR 9 million of which are provided by the Czech Republic itself.
- The landlocked Czech Republic has a net fish trade deficit. Imports consist mostly of saltwater species in fresh, frozen and processed form.
- In line with national production patterns, carp is the main export species.
- The number of fish farmers in the Czech Republic declined considerably between 2000 and 2008.

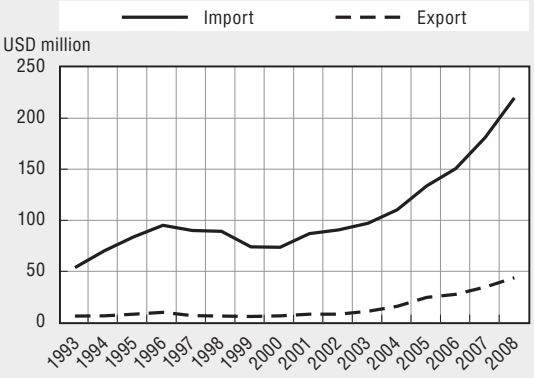
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD million)



Capacity

	2000	2008	% change
Number of fishers	n.a.	n.a.	
Number of fish farmers	2 340	1 373	–41.3
Total number of vessels	n.a.	n.a.	
Total tonnage of fleets	n.a.	n.a.	

Legal and institutional framework

As a land-locked country, the Czech Republic does not have any marine fishing activity. Activities relating to fisheries in the Czech Republic are classified into two areas: recreational fishing and fish farming/aquaculture.

Recreational fisheries

The management of recreational fishing grounds consists in the maintenance of river systems and the conservation of fish populations in locations where recreational fishing is taking place. More than 2 000 fishing grounds with an area of almost 42 000 ha are recorded. Some 350 000 recreational fisheries are registered members of associations.

Currently, fishing rights in the Czech Republic are regulated by Act No. 99/2004 Coll., of 10 February 2004, on fish farming, exercise of fishing rights, fishing inspection, protection of marine fishing resources, and on amending certain acts (the Fisheries Act), which came into effect on 1 April 2004, as amended by Act No. 444/2005 Coll., Act No. 267/2006 Coll., and Act No. 124/2008 Coll. The Fisheries Act is implemented under Decree No. 197/2004 Coll., of 13 April 2004, as amended by Decree No. 239/2006 Coll.

Moreover, several legislative regulations apply to recreational fisheries in the Czech Republic:

- Council Regulation (EC) No. 1005/2008 of 29 September 2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing, amending Regulations (EEC) No. 2847/93, (EC) No. 1936/2001 and (EC) No. 601/2004 and repealing Regulations (EC) No. 1093/94 and (EC) No. 1447/1999). And
- Act No. 114/1992 Coll., on the protection of nature and landscape.

Fish farming industry

Within the Czech Republic there are more than 24 000 ponds and reservoirs that cover a total area of approximately 52 000 ha. Of that total area, 42 000 ha of ponds are used for fish farming in Bohemia and Moravia. The theoretical volume of water in the ponds totals approximately 600 million m^3, while the actual amount of water in the ponds is around 400 million m^3. The reason for this difference lies in the ponds' high siltation levels. The amount of sediment is estimated at 200 million m^3.

The fish farming industry in the Czech Republic is also regulated by Act No. 99/2004 Coll., of 10 February 2004, on fish farming, exercise of fishing right, fishing inspection, protection of marine fishing resources and on amending certain acts (the Fisheries Act), which came into effect on 1 April 2004, as amended by Act No. 444/2005 Coll., Act No. 267/2006 Coll., and Act No. 124/2008 Coll.

Moreover, several EU legislative regulations apply to aquaculture. During the period 2005-09, the following regulations directly concerning the interests of the Czech Republic in fisheries and aquaculture entered into force:

- *Council Regulation (EC) No. 1198/2006 of 27 July 2006 on the European Fisheries Fund*

  The European Fisheries Fund (EFF) was established and defines the framework of Community support for the sustainable development of fisheries, fishing areas and inland fishing. The programming period is from 1 January 2007 to 31 December 2013. The Operational Programme for Fisheries was prepared on the basis of this regulation.

- *Council Regulation (EC) No. 708/2007 of 11 June 2007 concerning the use of alien and locally absent species in aquaculture*

  The Ministry of Agriculture (as co-manager) in co-operation with the Ministry of Environment conducted discussion and created a list of species that are commonly used in Czech aquaculture. The regulation governs only those species that will be newly introduced in aquaculture after the date of entry into force (from 1 January 2009).

- *Council Regulation (EC) No. 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European eel*

  The Ministry of Agriculture provided the European Commission with two plans for recovery of the European eel in the Elbe River basin and the Oder River basin. At present, the plans are consulted with the fishing organisations in the Czech Republic. They will then be submitted to the European Commission. These plans will allow the financing of elvers for their reintroduction into areas from which they can migrate and return for reproduction (the Morava River – Danube River basin cannot be supported from the European Union pursuant to legal regulations).

- *Regulation (EC) No. 762/2008 of the European Parliament and of the Council of 9 July 2008 on the submission by Member States of statistics on aquaculture and repealing Council Regulation (EC) No. 788/96 (Text with EEA relevance)*

  In 2010, the Ministry of Agriculture prepared an amendment to implement decrees for Act No. 99/2004 Coll., on fisheries. The decrees is of a technical character and will change the structure and scope of data collection to comply with European Parliament and Council regulations.

- *Council Regulation (EC) No. 1224/2009 of 20 November 2009 establishing a Community control system for ensuring compliance with the rules of the common fisheries policy, amending Regulations (EC) No. 847/96, (EC) No. 2371/2002, (EC) No. 811/2004, (EC) No. 768/2005, (EC) No. 2115/2005*

  The aim of the control regulation is to stipulate control and technical measures for fishing within the European Union. The Czech Republic, together with Sweden, the United Kingdom and France, support an exemption for recreational fishing under this regulation.

- *Council Regulation (EC) No. 1005/2008 of 29 September 2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing, amending Regulations (EEC) No. 2847/93, (EC) No. 1936/2001 and (EC) No. 601/2004 and repealing Regulations (EC) No. 1093/94 and (EC) No. 1447/1999)*

  This regulation applies to the Czech Republic, particularly in the area of control over fishing products exported by third countries to the Community (the implementing regulation became valid in October 2009), and it is executed through catch certificate controls carried out by the Customs Administration of the Czech Republic.

Aquaculture

For the Czech Republic, as a land-locked state, aquaculture plays the key role in fisheries production. Of the total aquaculture production of some 20 500 tonnes of fish in the Czech Republic, nearly 20 000 tonnes come from pond-fish farming. Pond-fish farming is a traditional means of rearing fish in the Czech Republic. From special facilities (mainly for trout farming), some 700 tonnes of fish are produced annually. About half of the total

production is supplied to the domestic market and the other half is exported. The species distribution of commercial fish species raised in the Czech Republic is relatively stable. Traditionally, the highest share in the overall volume of fish produced is that of common carp (*Cyprinus carpio*) – 87.8%. Salmonids (*Salmonidæ*) comprise some 3.8%, herbivorous fish (*Ctenopharyngodon idella*, *Hypophthalmichthys molitrix*, *Hypophthalmichthys nobilis*) 3.7%, common tench (*Tinca tinca*) 1.3%, and predatory fish (*Esox lucius, Silurus glanis, Sander lucioperca, Perca fluviatilis, Aspius aspius*) usually amount to 1.1% of the production.

In consideration of the historical development and present status of aquaculture production, the following areas represent particular priorities for the Czech Republic:

- preserving historical heritage in areas with traditional aquaculture;
- non-production functions of ponds;
- modernisation and competitiveness of this industry, as well as investment into its development;
- financial support to aquaculture;
- promoting quality products of aquaculture;
- preserving biodiversity;
- tackling the issue of piscivorous predators;
- purposeful applied research; and
- intensifying controls of the quality of products imported from third countries to the Czech Republic and to the European Union.

Fisheries and the environment

The Czech Republic has long been engaged in the worldwide effort to preserve biodiversity not only in the seas, but also in watercourses and sea-drainage areas. To eliminate adverse impacts of human activities on water environments, the Czech Republic draws not only on science, technology and education, but also on long-term experience in specific fish farming, and especially on raising carp (*cyprinis*) in ponds.

Over the past 15 years, the quality of the water in Czech watercourses and reservoirs has substantially improved due to economic restructuring as well as to changes in the inhabitants' behaviour and preferences. Compliance with water management regulations, especially sewage management, has contributed to this situation. The contribution of pollutants from point sources (industry and populated areas) and non-point sources (agriculture) has been reduced.

The European Union, of which the Czech Republic is a member since 2004, is committed to a high level of environmental protection and the Community's legal regulations are based on the precautionary principle. The European Commission will continue to emphasise the importance of environmentally sustainable development of aquaculture in its policies and measures. The European Commission will also continue to monitor developments in fish escapement, and, if need be, the European Commission will consider the added value of a possible measure at the Community level. The European Commission emphasises optimal breeding conditions, good health conditions of reared animals, and the use of quality feedstuffs corresponding with standards and the physiological needs of farmed aquatic organisms. Assuring good living conditions also contributes to improving the overall image of the aquaculture industry.

Government financial transfers

With EU membership in 2004, the Czech Republic gained access to subsidies for fisheries. In 2009, the following support funds were available:

- National Sector Support;
- Operational Programme for Fisheries; and
- Support under Annex No. 11 to Act No. 622/2006 Coll.

National Sector Support in fisheries: Direct grants for 2009

The grants are provided based on "Principles" which establish the conditions for providing such grants on the basis of Sections 2 and 2d of Act No. 252/1997 Coll. on agriculture. In 2009, the following direct support was provided to Czech entities.

Name	Number of recipients	Grant amount in 2009 (CZK)
Fish performance recording	8	4 205 550
Special advisory for animal husbandry	2	79 350
Support for non-production functions of ponds	52	74 350 950
Genetic resources	12	4 655 200
Renewing, dredging and reconstructing fishponds and constructing reservoirs (2007-10)	60	618 612 600

Operational Programme for Fisheries 2007-13

The European Fisheries Fund (EEF) was established based on Council Regulations (EC).

The Operational Programme for Fisheries 2007-13 (hereinafter just OP Fisheries) is being implemented in the Czech Republic in accordance with Council Regulation (EC) No. 1198/2006, approved by the European Commission on 11 December 2007. OP Fisheries includes:

- Priority Axis 2 – Aquaculture;
- Priority Axis 3 – Processing of fishery and aquaculture products and their marketing; and
- Priority Axis 5 – Technical assistance.

EUR 27.1 million are allocated by the OP Fisheries through the EFF for the Czech Republic, divided into: 44% for axis 2; 51% for axis 3; and 5% for axis 5. The Czech Republic committed to adding EUR 9.04 million from the state budget. A total of EUR 36.14 million is thus available for grants from OP Fisheries for 2007-13.

At the heart of the OP Fisheries strategy is promotion, followed by investments in fish farming and processing. OP Fisheries also supports for example European eel stocking, pilot projects and education.

The Czech Republic received two advance payments from the European Commission totalling EUR 3.79 million (on 21 December 2007 and 12 December 2008). As of 22 June 2010, 245 Decisions on Grants Provision amounting to CZK 396 million (approximately EUR 15.2 million) have been issued under OP Fisheries in the Czech Republic. Additional Decisions will be issued in July 2010 for projects registered in February and March 2010. Ninety-two applications for payment have been paid amounting to CZK 141 million (approximately EUR 5.4 million). The Decisions issued and projects paid cover all the priority axes of OP Fisheries.

Support under Annex No. 11 to Act No. 622/2006 Coll.

According to the "Binding rules for providing funds in relation to water in 2007 and for methods of controlling their utilisation," which form Annex No. 11 to Act No. 622/2006 Coll., on the state budget of the Czech Republic for 2007, and according to Part 2C, "Support for renewal, dredging and reconstruction of fishponds and water reservoirs", grants were provided under programme 229 210 – "Renewal, dredging and reconstruction of fishponds and reservoirs".

Detailed rules for ensuring the organisation and realisation of these programmes were established by the Methodological Direction of the Ministry of Agriculture for "Support for renewal, dredging and reconstruction of fishponds and reservoirs" (included in Section a) National Sector Support).

Post-harvesting policies and practices

Fish processing is closely associated with fish production. Fish is processed in 12 specialised establishments united under the Czech Fish Farmers Association, ten of which have permission to export to the European Union. In addition to freshwater fish, six establishments also engage in processing saltwater fish (the volume has decreased from year to year). The processing of saltwater fish, the purchase of which as a raw material for processing exceeds the volume of processed live freshwater fish, helps to improve the financial situation of the processing enterprises. All processing establishments are able to supply frozen fish products.

Smoking of processed freshwater and saltwater fish is carried out by seven entities. The proportion of freshwater fish processed into semi-finished products (carp halves, steaks and fillets) has been supplemented by grounded and seasoned fish meat (without bones and skin), which is used in preparing value-added products (fish balls, steaks, potato pancakes and other dishes).

The reason for slow changes in the fish processing industry is not due to technical unpreparedness, but to seasonality of consumption and the persistant opinion among consumers that only fresh or live fish is of the highest quality. A barrier affecting the total volume of fish processing is also the fact that other substitute food compete in price with fish.

Despite strict observation of the Guide to Good Manufacturing and Hygienic Practices in fish processing facilities, the domestic market prefers live fish.

Markets and trade

The Czech Republic imports more fish than it exports. Fish imports are more than double the volume of exports. The high volume of imports is due especially to the considerable quantity of imports of saltwater fish and products made from them. On the other hand, imports of live fish are much lower than exports. Carp consistently represents the largest share in exports of live fish.

Table 5.1. **Import of fish, crustaceans, molluscs and other invertebrates to the Czech Republic in 2009, by customs items**

CI	Name of group	Quantity (t)	Value (million CZK)
301	Live fish[1]	226.9	17.3
302	Fresh chilled fish	2 061.80	211.5
303	Frozen fish	11 754.70	332.2
304	Processed fish, filet	29 152.20	1 434.1
305	Dried salted smoked fish, fish flour	1 329.8	108.8
306	Langoustes, lobsters, shrimps, crabs and crayfish	660.6	84.9
307	Molluscs and other aquatic invertebrates	1 530.80	91.7

1. This relates to customs item 0301, from which are excluded data concerning aquarium fish.
Source: Customs statistics.

Table 5.2. **Export of fish, crustaceans, molluscs and other invertebrates from the Czech Republic in 2009, by customs items**

CI	Name of group	Quantity (t)	Value (million CZK)
301	Live fish[1]	8 256.2	426.9
302	Fresh chilled fish	286.6	29.6
303	Frozen fish	1 892.8	87.6
304	Processed fish, filet	7 086.7	409.7
305	Dried salted smoked fish, fish flour	640.8	54.2
306	Langoustes, lobsters, shrimps, crabs and crayfish	27.6	9.3
307	Molluscs and other aquatic invertebrates	619.3	72.5

1. This relates to customs item 0301, from which are excluded data concerning aquarium fish.
Source: Customs statistics.

PART III

Chapter 6

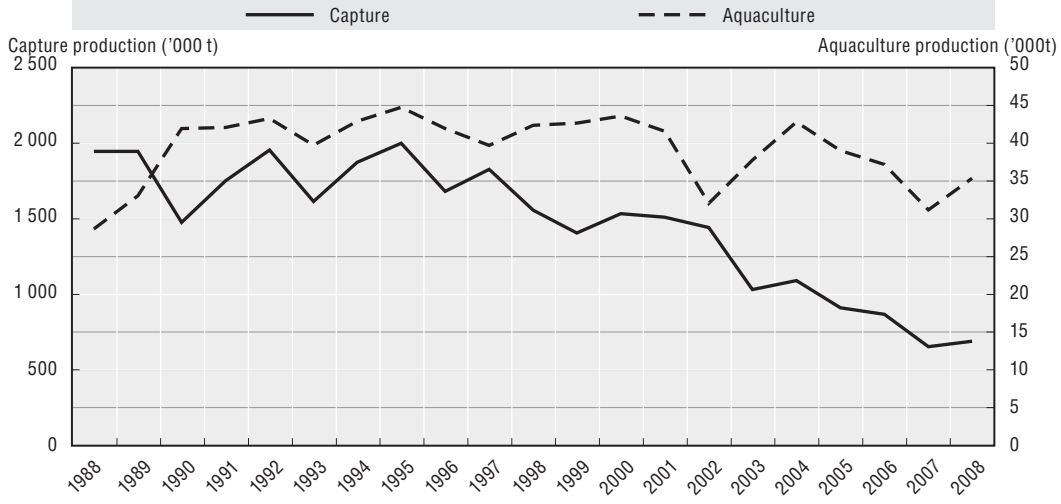
Denmark

Denmark

Summary of recent developments

- In 2010, a Committee set up by the government put forward recommendations on a new regulation of aquaculture based on environmental objectives on discharge from aquaculture installations instead of limits on the use of feed. The aim is to encourage sustainable growth in aquaculture production.
- Since 2007, most important fisheries are managed as individual transferable fishing rights within a framework outlined to protect smaller vessels and to avoid a high concentration of fishing rights. As a consequence, the number of commercially active vessels in the Danish fleet fell substantially in the period 2007-09.
- The process to designate additional Natura 2000 sites in Danish marine waters is complete. Some existing marine Natura 2000 sites have been extended and new areas have been designated. The sites are protected from the time of designation and fisheries will be regulated as appropriate.
- Denmark has initiated a pilot project on catch quota management. The project is implemented in accordance with the TACs and quota regulation for 2010 in which a catch quota management option was introduced. In the project, all catches of cod are counted against the quota.

Harvesting and aquaculture production (tonnes)

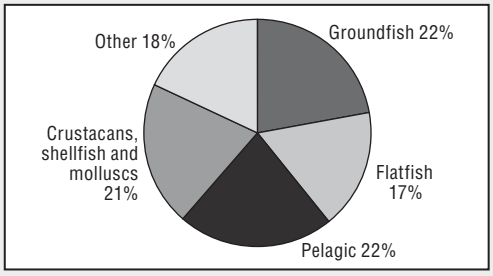


Source: FAO FishStat Database.

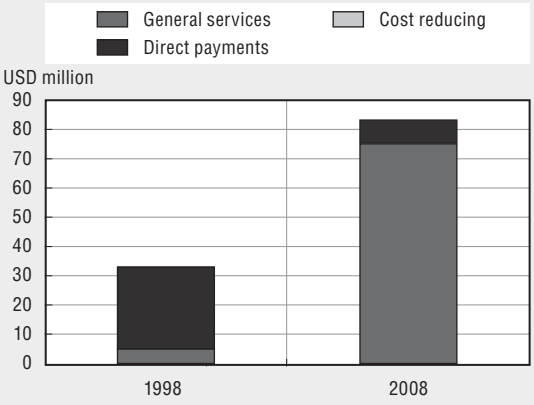
Key characteristics of the sector

- While overall landings have decreased considerably over the past decades (peaking in 1992 at 1.9 million tonnes to less than 700 000 in 2008), cod, Norway lobster, sandeel, plaice, herring and mackerel continue to be the main species landed.
- Government financial transfers are mainly dispersed to general services, *i.e.* management, research and surveillance/control. As for direct payments and cost reducing transfers, Danish public aid for the fisheries sector is gradually focussing more on collective measures and innovative and green investments.
- Denmark is a major exporter of fish products. In 2007, it was ranked sixth in the world according to the FAO. At the same time, Denmark is a major importer, ranked ninth globally, of raw materials used for further processing and then re-exported.
- Mainly due to the introduction of the new management regimes, the Danish fishing capacity in fleets and employment has decreased considerably in recent years. At the same time, the average profitably of vessels has increased.

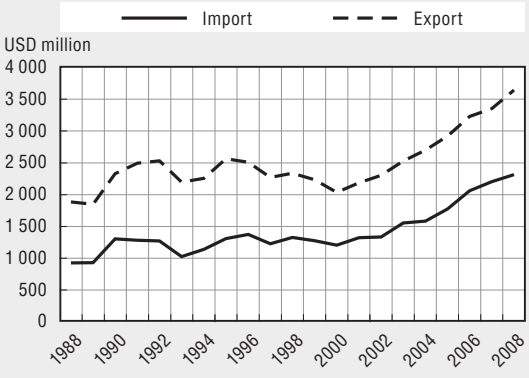
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	4 611	1 577	–65.8
Number of fish farmers	825	700	–15.2
Total number of vessels	4 178	2 890	–30.8
Total tonnage of fleets	106 150	n.a.	n.a.

n.a.: Not available.

Legal and institutional framework

The fisheries sector in Denmark – excluding Greenland and the Faroe Islands – is managed within the framework of the EU's Common Fisheries Policy (CFP).

The authority responsible for monitoring and enforcing EU and national conservation policies is the Directorate of Fisheries (*www.fd.dk*) which is part of the Ministry of Food, Agriculture and Fisheries (*www.fvm.dk*). The Directorate carries out inspection at sea and in harbours, as well as verification of EU marketing standards.

National legislation aims at utilising fishing opportunities while ensuring that Danish quotas are not exceeded. Technical rules are determined by the European Union on the basis of scientific advice and are assessed regularly. The 1999 Fisheries Act covers the protection of fish stocks, regulations on commercial and recreational fisheries, first hand sales, and duties. Minor changes were made in 2002 and again in 2008.

Capture fisheries

Performance

The activities of the fishing fleet in Denmark account for 0.1% of the Gross Domestic Product, whereas the entire fisheries sector including also aquaculture, fish processing, the wholesale and retail (fishmongers) branches accounts for 0.3% (2007). The economic performance of the Danish fishing fleet is shown in Table 6.1.

Table 6.1. **Economic performance of the Danish fishing fleet, 2005-09**

	2005	2006	2007	2008	2009
Number of registered vessels[1]	3 265	3 134	2 957	2 890	2.834
Number of commercially active vessels[1]	1 179	1 093	846	777	703
Number of employed	2 667	2 341	1 751	1 577	1 446
Total landing value (DKK million)	2 902	3 183	2 719	2 560	2 218
Average per commercially active vessel					[2]
Landing value (DKK 1 000)	2 395	2 785	3 053	3 076	2 955
Earning (DKK 1 000)	1 399	1 726	1 857	1 691	1 696
Operating profit (DKK 1 000)	384	620	829	609	695
Net profit (% of insurance value)	9%	15%	20%	20%	14%

1. A vessel is considered active if it has an annual catch value of more than DKK 245 875 (2009).
2. Preliminary estimate.

Source: Economic Situation for the Danish Fishery 2008, Institute for Food and Resource Economics.

The number of commercially active vessels in the Danish fleet fell by 40% over the period 2005-09. Employment and the total value of landings also fell substantially. However, the economic performance for the remaining commercially active vessels peaked in 2007 measured in operating profit and in 2007-08 measured as net profit. In 2009, a fall is forecast in relation to the peak in 2007.

This development is due to normal variations in fishing quotas and prices, to the financial crisis as well as to the introduction of new regulation. First, individual transferable quotas were introduced for herring in 2003, followed by mackerel and more species used for reduction. Second, fixed quota allocations were introduced in 2007 in the remaining part of the Danish fishery, including demersal fishery. As a result, several vessels have been taken out of the fishery and the remaining vessels have improved their economic performance.

Economic performance improved up to 2007-08 but is expected to fall in 2009, although not substantially. The Danish fishing fleet thus seems to overcome the financial crisis, with substantial falls in landing prices in 2009 (*e.g.* landing prices of the important species cod, plaice and Norway lobster fell by 30%, 32% and 38% from before the financial crisis in 2007-09) without deficits and only with a slight fall in the average economic performance. The reason for this is considered to be the positive development following the introduction of the new regulation.

Management

From 1 January 2007, a new regulation was adopted covering a number of the most important species. Based on historical landings, each vessel has been basically divided into three segments: 1) Fixed Quota Allocations (FQAs); 2) a segment for smaller vessels; and 3) a segment for other vessels. The third segment may not fish species which have been allocated to the other two segments, but several of the vessels conduct their fishery by means of Individual Transferable Quotas (ITQ).

FQAs are mainly in use in the demersal fishery, for example cod, plaice and sole, while ITQs are introduced in the fishery for herring, mackerel, sprat and industrial species. Both FQAs and ITQs reserve a share of the Danish Quota in a given fishery to the owner. In both systems, it is possible to trade the quotas, but certain rules prevent an inappropriate concentration of quotas. Until 31 December 2008, it was obligatory in the FQA-system to transfer part of the vessel GT, when transferring part of the quota. This restriction has been removed.

Some fisheries are regulated on the basis of personal licenses. These fisheries include brown shrimp along the west coast of Jutland and blue mussels in various Danish waters. Since 19 July 2009, licenses of blue mussel can be traded.

The European Union policy on fleet and fleet capacity has been implemented by the already existing rather tight entry-exit system. Overall capacity keeps falling and it is expected that this trend will continue because the reform of the regulation makes it possible to concentrate fishing rights among fewer vessels. Work on assessing overcapacity in the fishery confirmed that there is still some overcapacity in the short term, but that there is no risk that this overcapacity will be activated due to lack of fishing rights (FQAs).

In 2007, the European Council adopted a framework regulation for the recovery of the stock of European eel (Council Regulation (EC) No. 1100/2007 of 18 September 2007). The Regulation establishes a framework for the protection and sustainable use of the stock of European eel. Each EU Member State is required to establish eel management plans. The Danish Eel Management Plan consists of two elements:

- A management plan for inland fresh water in alignment with the objective, in the long term, of reducing anthropogenic mortalities so as to permit with high probability the escapement to the sea of at least 40% of the silver eel biomass relative to the best estimate of escapement that would have existed if no anthropogenic influences had impacted the stock, as described in Article 2 of the Council Regulation.
- A management plan for marine water, introducing reductions in fishing effort by at least 50% relative to the average effort deployed from 2004-06 in conformity with Article 8 of the Council Regulation.

Measures in fresh water include:

- a license system for professional fisheries;
- a closed fishing season for recreational fishermen and landowners; and
- restocking.

Measures in marine waters include:

- a license system for professional fisheries;
- a closed fishing season for recreational fishermen; and
- an increase of legal size for yellow eel.

Stock assessments in 2010 show an improvement for a wide range of fish stocks vital for the Danish fishery. However, a few stocks do not show any signs of improvement. Among these are cod in the Kattegat. Therefore, Denmark and Sweden have assigned areas in the Kattegat and northern Øresund, and introduced a ban against fishing gear intended for cod fishery in these areas, partly as temporary closed areas, partly as permanently closed areas.

Since 2006, Denmark has used risk-based control as a concept to enforce control of the Danish fishing fleet. This means that control resources are directed to those areas and fisheries where the risk of over-fishing and illegal fishing is greatest.

Access arrangements for foreign fleets

Denmark follows existing EU rules on access for fishing vessels to ports and landings of catches.

Recreational fishing

The recreational fishery is regulated by restricting the amount and kind of gear used. It is forbidden to sell fish caught in the recreational fishery. Apart from these regulations, national measures include the release of fish and research financed by fees charged for recreational fishing permits.

A 2009 study on recreational fishery shows that a total of 616 000 people make angling one of the most popular spare-time activities in Denmark. The effect on employment amounts to around 2 500 people. Spending by Danish and foreign anglers in Denmark totalled DKK 2.85 billion.

Fisheries and the environment

The process to designate additional Natura 2000 sites in Danish marine water is complete. Some existing marine Natura 2000 sites have been extended, *e.g.* in the Skagerrak area just north of Skagens Gren, and new areas have also been designated. As with all the previously designated Natura 2000 sites, Natura 2000 management plans will be drawn up at the latest six years after the European Commission has approved them. National authorities will be obliged to adopt appropriate measures in accordance with the objectives set out in the management plans. As the sites are protected from the time of designation, the national authorities are, herein after in compliance with the habitats directive and the national fisheries legislation, obliged to regulate fisheries in the protected areas when appropriate. Thus the role of fisheries in the protected areas will be discussed and regulated when, and if, such measures are necessary for the protection of particular sites.

Aquaculture

Except for farms with no outlet to the environment, all Danish fish farms must be officially approved in accordance with the Danish Environmental Protection Act. In order to meet the environmental requirements for freshwater farming, there are strict and fixed limits on the use of feed and specific requirements regarding water use, rinsing and outlets, and removal of waste and offal. When stipulating these requirements, broad environmental considerations are taken into account. At the moment, other regulations are being investigated on the basis of environmental objectives and with discharge requirements and negotiable nitrogen shares.

An Aquaculture Committee has put forward recommendations on the future development of the aquaculture industry. One suggestion by the Committee is to achieve discharge objectives by introducing transferable quotas on the discharge of nitrogen from fish farms. The recommendations of the Committee are now under consideration.

From 2010, organic labelling of aquaculture production is done in accordance with new EU rules.

In Denmark, the most important factor limiting growth in aquaculture is pollution of nitrogen and phosphor. Hence, in order to limit this pollution, water purifying systems have been developed in freshwater aquaculture over the last four to five years. In 2009, 22% of the production in freshwater ponds originated from either intensive or semi-intensive water purifying systems. Production in water purifying systems has polluted considerably less per kilo of produced fish, implying that either growth might be possible without increasing pollution, or that pollution can be reduced without reducing production.

Studies have shown that productivity of production in traditional freshwater ponds and in ponds using the new intensive or semi-intensive water purifying systems do not differ. Given this situation the present regulation with feed quotas has become a barrier for development. The implication is that a government commission lead by the Danish Environmental Protection Agency has recommended the introduction of individual transferable quotas on nitrogen in Danish aquaculture, which might also be transferable with polluters in other sectors. The recommendation has been well received broadly, but a decision remains to be taken.

Approximately 700 people are directly employed in Danish aquaculture, mainly in traditional fish farming. A significant number are also employed upstream and downstream or in associated industries such as smokehouses. Aquaculture production in Denmark is mainly focused on rainbow trout *(Oncorhynchus mykiss*), farmed in freshwater systems and in off-shore or land-based marine aquaculture. In addition, eel is farmed in re-circulated freshwater systems. Mussels, oysters and crayfish are produced in small quantities. Turbot fry is produced mainly for export. A variety of other species is produced in small amounts or raised primarily for restocking.

A new report, *The Sea – A New Resource*, recommends research and development in order to investigate the social and economic potential of exploiting new resources from the sea. The working group behind the report indicates that although many fish species are at present over-exploited, many other species could be exploited in a responsible and sustainable way. Furthermore, the sea offers possibilities to cultivate raw materials and feed-stuffs or to extract marine bio-chemicals and new materials.

Government financial transfers

All major support schemes for fisheries are part of EU schemes. The structural scheme is financed by the European Union and Danish public funds, whereas aid in the framework of the market organisation is entirely financed by the European Union. Table 6.2 shows the 2010 budget for structural aid. Danish Public aid for the fisheries sector is gradually focussing more on collective measures and innovative and green investments. In 2009-10, special measures to improve fuel efficiency have been implemented.

Table 6.2. **2010 budget on national aid and aid from the European Fisheries Fund (DKK million)**

	European Union	National	Regional	**Total**
Modernisation of vessels and young fishers	6.0	6.0	0	**12.0**
Measures to improve fuel efficiency	50.6	2.7	0	**53.3**
Processing and aquaculture	36.4	36.4	0	**72.8**
Collective measures, pilot projects, fishing ports and fresh water programmes	91.0	22.6	69.0	**182.6**
Local community programmes	36.1	15.2	10.0	**61.3**
Technical assistance	2.0	2.0	0	**4.0**
Grand total	**222.1**	**84.9**	**79.0**	**386.0**

National support schemes include a general measure to encourage development and innovation in the food industry sector. In addition, the government pays for management, control and research into capture fisheries. Expenditure in these areas amounted to approximately DKK 437 million in 2010.

In 2009, a temporary decommissioning scheme was introduced as part of an energy efficiency package with a target of a 5% reduction in fuel consumption of the fleet. The package was based on EU Regulation No. 744/2008 and the implementation was done after extensive consultation with the industry. Vessels with energy costs over 30% of production costs could apply for the aid. Applications for decommissioning had to be part of a restructuring program for two or more vessels. Applications were selected on the basis of the expected energy saving of these programmes.

Fleet capacity was already managed on the basis that any entry of capacity must be compensated by exit of the same size. Vessels decommissioned with aid may not be replaced and the decommissioned tonnage/power was deducted from the existing ceiling on access to the fleet.

The administration collects data on the performance of the projects and the scheme will be evaluated as part of an interim evaluation of the Danish European Fisheries Fund programme.

Post-harvest practice and policies

In 2006-07, further concentration in the processing and handling facilities took place with a decreasing number of companies in all sectors as compared to 2005. Total sale decreased in fish wholesale, but increased for the remaining sectors. Hence, average sale per company increased. The structure of the processing industry and trading firms and their development between 2006 and 2007 is shown in Table 6.3. It should be noted that "business units" refers to the average local economic units registered as VAT contributors within a firm.

Table 6.3. **Danish processing industry and trading firms in 2006 and 2007**

	Number of business units		DKK million			
			Sales		Average sales	
	2006	2007	2006	2007	2006	2007
Smoking and drying	59	55	1 573	1 704	26.7	31.0
Canning and filleting	81	75	10 439	10 672	128.9	142.3
Fish meal and oil	5	6	2 140		428.0	
Wholesale trade	413	403	15 471	14 335	37.5	35.6
Retail trade	268	266	591	608	2.2	2.3

1. Industry grouping according to the Danish DB03 nomenclature, which conforms to the EU classification NACE.
2. Smoking and drying: DB03 152020; canning and filleting: DB03 152010; fish meal and oil: DB03 152030; wholesale trade: DB03 511710 and 513810; retail trade: DB03 522300.

Source: Yearbook of Fishery Statistics 2007-08.

Markets and trade

Markets

Knowledge of domestic consumption of seafood products is limited because no official statistics on seafood consumption exist. However, some *ad hoc* surveys are available. The last consumer survey dates from 2001 and suggests an annual per capita consumption of EUR 80, corresponding to a total Danish consumption of EUR 430 million. The quantities consumed are not known, but are estimated to be in the range of 20-25 kg live weight per capita. By value, shrimps, whitefish, salmon, trout and herring account for two thirds of total consumption. Seafood products are sold in several different product forms with canned, preserved and fresh being the most important. Meanwhile, there are indications that the consumption of farmed fish such as salmon has been increasing over a longer period. This is also the case for imported cold water shrimp. At the same time, the consumption of traditional species such as whitefish, flatfish and herring is falling. Fresh fish and convenience seafood products are on the increase and as international trade increases, the supply of fish becomes wider.

Denmark is a major exporter of fish products. In 2007, it was ranked sixth in the world according to FAO. At the same time, Denmark is a major importer, globally ranked ninth, of raw materials used for further processing and then re-exported. Danish imports and exports are shown in Table 6.4.

Trade

Exports consist of several different species. Salmon, whitefish and shrimps are by value the most important, followed by fishmeal and oil, herring and flatfish. Trade in salmon has been increasing, whereas trade in whitefish has been decreasing. Other EU countries purchase 83% of Danish exports, while exports to other parts of the world, including central and Eastern Europe and China, are increasing. Russia receives an increasing amount of herring and cold water shrimp, whilst China increasingly imports cod and cold water shrimp. Herring and cold water shrimp are consumed in Denmark, whereas frozen cod is filleted and re-exported mainly to the European Union and the United States. This is mainly done by Danish companies which have outsourced their processing activities due to lower wage costs. Employment in semi-processing (filleting) activities is decreasing, whereas employment in processing, wholesale and retail sale of fresh fish remains more stable.

Table 6.4. **Imports and exports of Danish fish products, 2008-09**

	Exports		Imports	
	Tonnes	DKK million	Tonnes	DKK million
2008				
Unprocessed	377 684	7 344 525	395 288	5 258 270
Semi-processed	131 193	4 724 181	75 133	2 346 513
Processed	138 794	4 380 610	86 737	2 587 146
Fish meal and oil	356 164	2 320 246	597 832	2 043 226
Total	**1 003 834**	**18 769 562**	**1 154 990**	**12 235 154**
2009				
Unprocessed	352 045	6 166 255	375 427	4 598 588
Semi-processed	112 101	4 240 209	68 543	2 127 619
Processed	119 549	3 901 575	76 047	2 042 195
Fish meal and oil	461 349	2 506 281	676 565	1 788 284
Total	**1 045 043**	**16 814 320**	**1 196 583**	**10 556 687**

Note: Fish products for consumption: unprocessed: HS-codes 0301, 0302, 0303, 0306 and 0307; semi-processed: 0304 and 0305; processed: 1604 and 1605. Fish meal and oil: both unprocessed and processed: 0511, 0508, 1504, 2301 and 2309.
Source: The Danish Directorate of Fisheries Foreign Trade Register.

Imports of significant quantities originate from a relatively limited number of countries located mainly in the Northeast Atlantic area. Salmon is imported from Norwegian farms, cold water shrimp from Greenland and Canada and herring from Norway. Whitefish has traditionally been supplied by Norway and the Faeroe Islands, but today supplies are widening. Falling European supplies of cod are to some extent being replaced by imports of pangasius from Southeast Asia and Alaska Pollack from the United States and Russia.

Concerning trade policy, please see Chapter 8 on the European Union.

Outlook

It is expected that new management arrangements will encourage the fleet to more easily adjust to fishing possibilities and changes in markets. Overall capacity will continue to fall and economic performance of the industry will improve.

The European Fisheries Fund measures will be evaluated and revised in 2010-11. The measures will also be adjusted in the context of the Common Fisheries Policy in 2012.

Discussions on aquaculture reform will continue and are expected to eventually lead to changes in management in order to improve production and economic results, and possibly introduce new ways of managing and controlling effects on the environment.

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PART III

Chapter 7

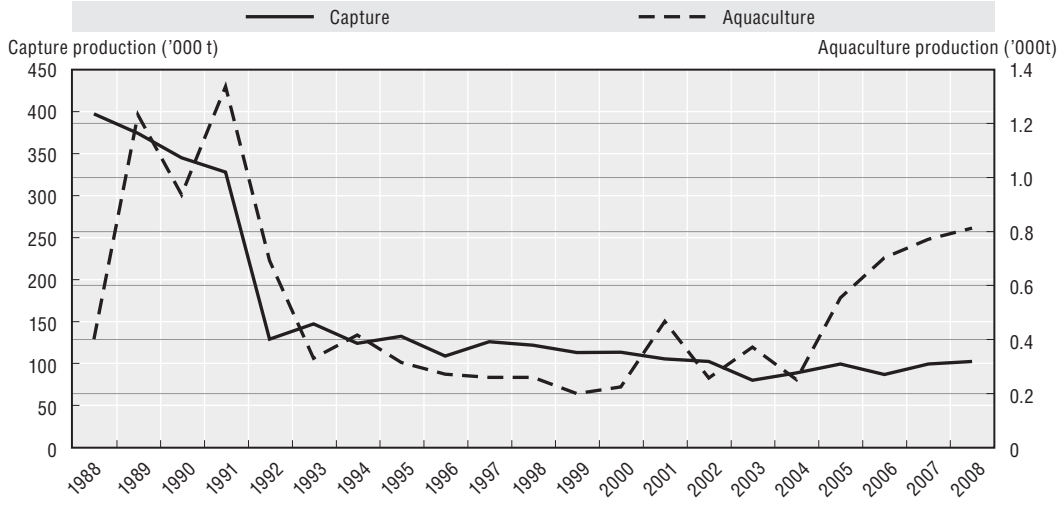
Estonia

Estonia

Summary of recent developments

- The main goal of the Estonian Fisheries Strategy 2007-13 is to achieve the sustainable use of resources and to restructure the sector so as to increase the income of people dependent on fisheries. This restructuring would take into account the availability of resources and market developments, and be based on a "sectoral approach" with special measures for each fisheries sector.
- Selected components of the restructuration strategy are:
  - Research and development, including improving scientific advice, finding efficient fisheries management systems, designing more selective fishing gear, improving product quality, developing human resource by training, better information flow and advisory systems.
  - Adapting fleet size to resources.
  - Increasing the competitiveness of producer organisations through value addition in the pelagic sector.
  - Creating alternative income opportunities in coastal areas.
  - Developing efficient port infrastructures.
  - Increasing aquaculture production to meet domestic needs, using efficient and environmentally friendly technologies, such as on-shore recirculation systems.

Harvesting and aquaculture production (tonnes)

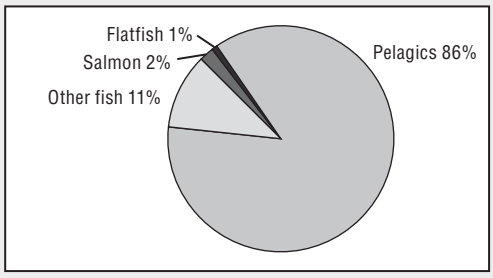


Source: FAO FishStat Database.

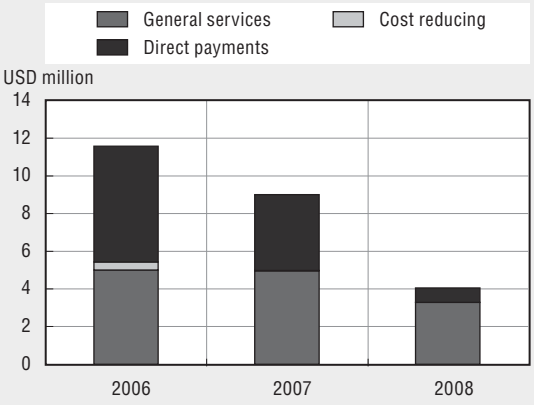
Key characteristics of the sector

- Total capture fisheries production in Estonia was 97 245 tonnes, valued at EUR 60.1 million, in 2009. Pelagics, in particular Baltic herring and sprat, account for the largest share of landings.
- For 2007-13, EUR 84.6 million are allocated to Estonia through the European Fisheries Fund. The Estonian government contributes an additional EUR 28.1 million.
- The total amount is distributed between five priority areas: *i)* adaptation of the fishing fleet; *ii)* aquaculture, inland fishing, processing and marketing of the fishing products; *iii)* measures of common interest; *iv)* sustainable development of fisheries areas; and *v)* technical assistance.
- The share of canned product imports grew by 26% and the share of fresh/frozen fish by 11% between 2007 and 2008. The Russian Federation is a key trading partner.
- Employment in harvesting and processing is declining, while increasing in aquaculture. Preliminary figures for 2009 confirm these trends.
- The fleet is divided by length into four segments, with vessels up to 12 metres accounting for about 65% of the fleet.

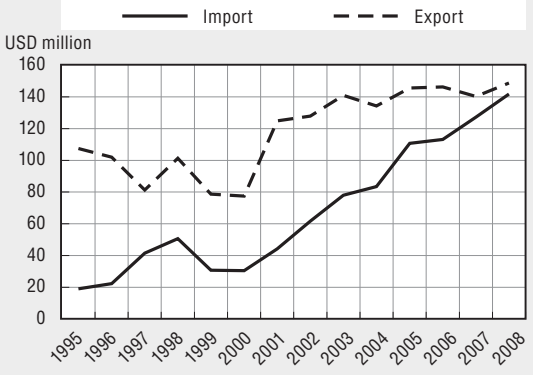
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2006	2008	% change
Number of fishers	4 010	3 788	–5.5
Number of fish farmers	95	96	1.1
Total number of vessels	993	965	–2.8
Total tonnage of fleets	20 712	17 418	–15.9

Legal and institutional framework

Fisheries administration and governance is shared by two ministries, the Ministry of the Environment and the Ministry of Agriculture. The Fisheries Resources Department of the Ministry of the Environment manages and co-ordinates research, assessment, exploitation, reproduction and protection of fish resources. The Fishery Economics Department of the Ministry of Agriculture deals with the administration of fishing activities, manages aquaculture, production, processing and marketing of fish and fish products as well as market regulation issues and the European Fisheries Fund (EFF) and other state support. One of the main functions of the Fishery Economics Department of the Ministry of Agriculture is the implementation of structural policies for the fishing and fish processing industries.

The basis of the Estonian fisheries law is the Fishing Act adopted in 1995. Other key fisheries legislation are the Fishing Rule, the Fisheries Market Act (2004) (regulates different support measures like the EFF and state aid measures and provides market regulation), the Act on Sustainable Development (1995), the Water Act (1994), the Pollution Charge Act (1999), the Act on Protection of Marine and Freshwater Coasts, Shores and Banks and the Act on Environmental Impact Assessment (2000).

Stock assessment and advice formulation for Lake Peipsi-Pihkva stocks are regulated by the Estonian-Russian Intergovernmental Commission. Twice a year, the commission meets to settle the terms for allowable catch volumes, research programmes, surveillance, technical measures and exchange information.

Capture fisheries

Performance

In 2008, total landings of the Baltic Sea coastal and open sea, inland waterbodies and Atlantic Ocean were 99 378 tonnes for a total value of EUR 82.1 million. In 2009, total landings were 97 245 tonnes for a value of EUR 60.1 million.

The main target species in the Baltic Sea are Baltic herring, sprat, cod, perch; in the high seas northern shrimp; in inland fisheries perch, pike-perch, pike and bream.

In 2008, employment in the harvesting sector was around 1 000 people, in the processing sector 2 300 and in the aquaculture sector around 100 people. In 2009, these numbers changed to 800 for harvesting, 1 700 for processing and 100 for aquaculture.

There are four segments in the vessel register. Segment 4S1 (vessels > 12 m), 4S2 (boats up to 12 m), 4S3 (vessels 12-40 m) and 4S4 (boats up to 12 m).

Table 7.1. **Estonian fleet composition (number of vessels per segment)**

	4S1	4S2	4S3	4S4
2008	64	883	6	403
2009	55	875	4	412

Status of fish stocks

In 2008-09, the main commercial fish stocks in Estonia were stable. Biomass of the spawning stock of Baltic herring in the coastal Baltic Sea increased by 5% in 2008. ICES considers the exploitation of open Baltic Sea herring stocks to be at sustainable levels.

Biomass of the spawning stock of sprat was over 20% of the long-range average. However, ICES classifies Baltic sprat exploitation as non sustainable as fisheries mortality exceeds sustainable levels. Nevertheless the generation of 2008 sprat stocks was large.

The biggest quota in distant waters is for northern shrimp, *Pandalus borealis*, mostly in NAFO 3M but also in NAFO 3L and the Svalbard area. Other species of great commercial interest are Greenland halibut, redfish *Sebastes sp.*, and rays (*Rajidæ*). Among these resources, only shrimp stocks in NAFO 3L and 3M are in good shape.

Management of commercial fisheries

Main management measures in Estonia are individual transferable quotas (ITQs) in the open water fisheries (both Baltic and Atlantic trawling) and gear usage quotas in the Baltic coastal and inland fisheries.

Changes in management instruments

Since 2008, minimum numbers of gillnets were introduced as a technical measure in small scale fisheries and inland fisheries. Fisheries permits are to be issued for at least ten nets at a time.

The demersal seine fishery in Lake Peipsi and the trapnet fisheries in Lake Peipsi, Lämmi and Pihkva have to transmit fishing licence data and report catches to the Environmental Inspectorate one hour before landing. This requirement entered into force in 2009.

Access conditions

All fishing rights are based on the historical catch principle and are fully transferable. There are no restrictions for foreign capital, and foreigners can freely invest in the fish harvesting and processing sectors. Fishing in the exclusive economic zone is, however, prohibited for foreign fleets.

Management of recreational fisheries

The basis of the recreational fisheries law are the Fishing Act and the Fishing Rule. The following items are classified as recreational fishing gear:

- spinning reels, trolling lines, pulling devices, fly hooks, bottom lines, krunda, unanchored trimmers, hand lines and more than one simple hand line;
- harpoon guns and harpoons;
- hooks;
- entangling nets;
- longlines consisting of up to 100 hooks; permanent residents of small permanently inhabited islands are permitted to use longlines consisting of up to 300 hooks;
- dragnet;
- hoopnet;
- dip-nets and traps.

No more than three items of fishing gear of the same or different types shall be used concurrently in recreational fishing, except for troll lines, dip-nets and traps, unless otherwise provided for in the Fisheries Act.

Recreational fishing rights are certified by the receipt of the recreational fishing rights fee and the fishing "card" (for gillnet fishing). Fishing cards are issued by the Environmental Board. In general, recreational fishing can be performed without a licence and catches are not registered.

Special arrangements exist for permanent residents of small permanently inhabited islands:

- permanent residents of small permanently inhabited islands are permitted to use longlines consisting of up to 300 hooks (others are allowed 100 hooks);
- a permanent resident of a permanently inhabited small island may use, on the basis of one fishing card, up to three entangling nets and one longline consisting of up to 300 hooks at sea up to the 20 m isobaths, or an area with the width of one kilometre on a lake surrounding the island of the location of residence;
- a professional fisherman who is a permanent resident of a permanently inhabited small island may be issued a fishing permit for the use of five or more entangling or enmeshing nets (for water bodies where the permitted fishing opportunity for entangling or enmeshing nets is ten or more nets, a fishing permit shall be issued for the use of at least ten nets at a time).

Monitoring and enforcement

Council Regulation (EC) No. 861/2006 establishes financial measures for the implementation of the common fisheries policy (CFP) and in the area of the Law of the Sea. Financial measures shall contribute towards the following general objectives:

- improving the administrative capacity and the means for control and enforcement of CFP rules;
- improving the collection of data necessary for the CFP;
- improving the quality of scientific advice for the purposes of the CFP;
- improving the technical assistance supporting the management of the Community fishing fleet for the purposes of the CFP;
- improving the involvement of the fisheries sector and other interest groups in the CFP and promoting dialogue and communication between them and the Commission;
- implementing measures relating to Fisheries Partnership Agreements and other bilateral or multilateral agreements for the purposes of the CFP, and in particular towards ensuring the sustainability of fisheries resources in third country waters and on the high seas;
- implementing measures relating to the Law of the Sea.

All member states will be equipped in such a way that controls are carried out to a high standard. In order to ensure that Member States accomplish their obligation under the CFP rules, the Community supports the member states in their investments in the

control area. In the control area and enforcement the following expenditures shall be covered by financial measures:

- Expenditure incurred by Member States in implementing the monitoring and control systems applicable to the CFP for:
  - investments relating to control activities carried out by administrative bodies or by the private sector including implementation of new control technologies and the purchase and modernisation of control means;
  - training and exchange programmes of civil servants responsible for monitoring, control and surveillance tasks in the fisheries area;
  - implementation of pilot inspection and observer schemes;
  - cost/benefit analysis as well as assessment of audits performed and expenditure incurred by competent authorities in carrying out monitoring, control and surveillance;
  - initiatives, including seminars and media tools, aimed at enhancing awareness both among fishermen and other players such as inspectors, public prosecutors and judges, and among the general public of the need to fight irresponsible and illegal fishing and on the implementation of the CFP rules.
- Expenditure relating to administrative arrangements with the Joint Research Centre, or any other Community consultative body, to analyse the implementation of new technologies.
- All operational expenditure related to inspection, by Commission inspectors, of the implementation of the CFP by the Member States, and in particular inspection missions, safety equipment and training of inspectors, meetings and the charter or purchase by the Commission of inspection means.
- Contribution to the budget of the Community Fisheries Control Agency (CFCA) to cover staff, administrative and operating expenditure relating to the annual work plan of CFCA, including communication costs and expenditure linked to space technology.

There will be further investments in control and enforcement in 2010-12, including approximately EUR 620 000 for an electronic system for fishing reports. The majority of funding is provided by the Commission but the Environmental Investment Centre also makes a contribution.

Multilateral agreements and arrangements

Fisheries issues (including fisheries research, surveillance) on the shared Lake Peipsi-Pihkva are regulated by the Estonian-Russian Intergovernmental Commission, which was created according to the agreement on cooperation between the governments of the Republic of Estonia and the Russian Federation on the conservation and use of fish resources on Lakes Peipsi, Lämmi and Pihkva.

Aquaculture

Policy changes

The development of the sector is included in the fisheries framework document *Estonian Fisheries Strategy 2007-13*. Funding for the upgrading of the aquaculture sector became available with the adoption of the Operational Programme of the European Fisheries Fund (2007-13).

Production facilities, values and volumes

There are around 20 commercial companies whose main/important activity is fish farming. Most engage in multiple activities, including commercial production of several species, producing at the same time fish for consumption, offering fishing tourism in put-and-take ponds and producing juveniles for the state restocking programme. The main species on most of these farms is rainbow trout, and in some others it is carp, European crayfish (*Astacus astacus*), and eel. Two farms are specialised in growing fish for stocking purposes. In 2006, there were 96 people employed in aquaculture; in 2009, this figure grew to around 100. Extension of the production cycle and processing of aquaculture production on-the-spot could further increase the employment rate.

Table 7.2. **Aquaculture production (tonnes), 2006-09**

Species	2006	2007	2008	2009
Rainbow trout	520	622	649	790
Carp	80	28	70	74
Eel	40	45	47	30
Crayfish	0.8	3	2	11
Other	63	93	47	66
Total	**703**	**781**	**815**	**971**

Fisheries and the environment

Environment related fisheries development projects in 2008 and 2009 included sustainable fisheries at Lake Peipus, promotion of recreational fisheries, fisheries research (research of reproduction, estimations of spawning rivers and influences of foreign species), reproduction of fish stocks (introduction of crayfish, seatrout and eel, construction of artificial spawning areas) and monitoring and enforcement activities. Investments in these areas in 2008 amounted to EUR 2.1 million and to EUR 1.8 million in 2009.

Under the third axis of the European Fisheries Fund (EFF), Common Interest Measures (more specifically *Protection and development of aquatic fauna and flora*) it is possible to implement projects, which are related to the environment, provided that the overall goal keeps in mind the interests of professional fishermen. At the moment one such project is being implemented in Estonia. The project is called *Supplying the Narva river canyon with water*.

Two other projects, *Current state of the spawning grounds in Estonia and the possibilities for their rehabilitation* and *Supporting the natural reproduction of pike-perch by introducing artificial spawning facilities,* have been approved and their implementation will begin soon. Both projects will deal with the conservation of resources through the improvement and restoration of existing spawning areas.

Government financial transfers

European Community pre-accession funds assured compliance of Estonian processing plants and aquaculture facilities with EU sanitary and hygiene regulations. Nowadays, the main source of financing of the Estonian fisheries sector is the EFF. The financing of the Operational Programme in Estonia foresees the total expenditure to be EUR 84.6 million during the period 2007-13. With Estonian co-financing the total public expenditure will amount to EUR 112.7 million. This amount is distributed between five priority axes:

- adaptation of the fishing fleet (EUR 20.3 million);

- aquaculture, inland fishing, processing and marketing of the fishing products (EUR 32.8 million);
- measures of common interest (EUR 28.3 million);
- sustainable development of fisheries areas (EUR 25.7 million);
- technical assistance (EUR 5.6 million).

There are several classifications for financial transfers to the fisheries sector. With a view to highlight which categories exist in Estonia, the following systems will be used:

- *Direct payments:* In this category the most important measures are support schemes to modernise the assets of fishing enterprises (vessels, gears, harbours, etc.) and to decommission vessels. Most of the direct payments come from the EFF. Considering the support from the first, the second and the fourth priority axes as direct payments, direct payments for 2007-13 amount to EUR 79 million. The annual average is EUR 11.3 million but payments were lower in 2007 and 2008 and will be higher in 2009 and 2010. Before the EU accession there were no mechanisms to increase revenues or for market interventions in Estonia. In 2008, the intervention measures covered 4.4% of the Baltic herring total allowable catch (TAC) and 3.6% of the sprat TAC in Estonia. This carry over mechanism provides the possibility of processing and storing of fish for human consumption in the case of unfavourable market conditions. The carry over support in 2008 was EUR 735 000, in 2009 EUR 1.8 million.
- *Cost-reducing transfers:* The only measure in this category is fuel tax exemption. The fishermen have the possibility to apply for exemption from the fuel tax. In 2008, the value of this exemption for the fisheries sector compared to normal business conditions, the exemption for the fisheries sector was EUR 1.32 million in 2008.
- *General services:* Such measures include: research, management and enforcement expenditure, regional development grants, support to build port facilities, payments to producer organisations, expenditure for restocking of fish resources and for fisheries information collection and analysis. Very rough estimates show that general services (paid from state budget and from the Environmental Investment Center) amounted to a value of EUR 5.2 million in 2008. The third and the fifth axes of the EFF could be classified as general services which provide an additional amount of EUR 33.9 million for the period 2007-13. In 2008, the total amount of general services was EUR 10 million.

Table 7.3. **Government financial transfers associated with fishery policies (EUR), 2008-09**

	2008	2009
Direct payments	18 674 969	12 402 839
Cost reducing transfers	532	1 140
General services	2 697 833	10 705 069

Social assistance

Social assistance is financed through the Estonian National Development Plan for the implementation of the EU Structural Funds – Single Programming Document 2004-06, Measure 3.12 "Other Fisheries related Measures", sub-measure 3.12.1 "Social Measures Accompanying the Restructuring of the Fisheries Sector". The purpose of this grant is to support fishermen, in particular crew members, who will lose or have lost their jobs due to

fleet resizing measures. Each applicant can submit only one application. The maximum allowance amounts to EUR 10 000 and depends on the situation of the candidate and the number of crew members. The amount of aid granted in 2004-07 was EUR 430 000 and amounted to EUR 10 000 in 2008. No such aid was provided in 2009, but the European Fisheries Fund Operational Programme 2007-13 measure 1.5 "Socio-economic measures" restored this opportunity from 2010.

Structural adjustment

The purpose of structural adjustment measures is to ensure adjustment of the fishing capacity, primarily of the Baltic Sea trawl fishing fleet to fishery resources and to modernise the fishing fleet to comply with environmental, working condition, safety and hygiene requirements.

In order to adjust fishing capacity, scrapping of vessels is complemented by altering the purpose of vessels, which also contributes to the fishermen's employment diversification. These priorities are financed under EFF priority axis 1: Adaption of fishing fleet.

- *Measure 1.1. Public aid for permanent cessation of fishing activities:* Purpose of the measure is to secure balance between the fishing capacity of fishing vessels and the available resources. Potentially supported actions are scrapping of fishing vessel and reassignment of fishing vessel for activities outside fishing.
- *Measure 1.3. Investments on board fishing vessels and selectivity* and *Measure 1.4. Small-scale coastal fishing:* Purpose of the measures is to favour investments into the fishing fleet directed at improving fuel economy, improving environmental and safety conditions on board, improving selectivity of fishing gear and working conditions. Potentially supported actions are improvement of safety on board, working conditions, hygiene, product quality, energy efficiency, selectivity provided for in Article 25 (7) and (8), replacement of engine provided for in Article 25 (3)(a), (b) and (c) and other investments on board fishing vessels.

In 2009, the fishing fleet was reduced by eight trawlers (segment 4S1) under Measure 1.1 of the EFF. As a result, the fishing capacity decreased by 1 237 GT and 2 605 kW. Another 13 trawlers (2 426 GT, 5 017 kW) have been approved for scrapping or for reassignment. The target set in the Operational Programme of the EEF 2007-13 to reduce the fishing fleet's capacity by 5% for 2010 has been fulfilled.

Between 2004 and 2009, the fishing fleet was reduced by 19 trawling vessels (segment 4S1) with the help of the Financial Instrument for Fisheries Guidance. Fishing capacity decreased by 1 897 GT and 4 968 kW.

Post harvesting policies and practices

Food safety

All rules and regulations to ensure the safety of fisheries products for human consumption are in compliance with EU regulations. There are no additional domestic standards. The quality of fish products is regulated by the Food Act, which is in accordance with EU Regulations 178/2002, 852/2004, 853/2004, 882/2004 and 1935/2004. The Food Act establishes the basis for food processing, processors' self control (HACCP) and the state supervision of food safety and is rather well implemented in the fisheries sector.

Information and labelling

The requirements on the minimum level of information that should accompany a product is regulated through Council Regulation (EC) No. 104/2000 on the common organisation of the markets in fishery and aquaculture products and by the Commission regulation (EC) No. 2065/2001 which lay down detailed rules for the application of Council Regulation (EC) No. 104/2000 with respect to informing consumers about fishery and aquaculture products. These regulations establish labelling rules and specifications for fisheries products' commercial designations, method of production and catch area.

Based on those regulations, Regulation No. 28 by the Minister of Agriculture of Estonia (list of product names and types of fisheries products, fishery products in small quantities) was established in 2006. It requires that the annex of the label indicates the species name in Estonian. This requirement does not apply to small volumes.

Structures

To increase the efficiency of distribution and marketing, Measure 3.1 of the EFF enables collective investments concerning production, processing or marketing equipment and infrastructure, including waste treatment. The aim is to increase the sector's sustainability and competitiveness by favouring collective action.

Processing and handling facilities

In the Baltic Sea fisheries the vertically integrated companies are organised in producer organisations. Through the EFF collective actions support measure the activities of these companies are concentrated also horizontally to improve their market position in key markets in Ukraine and Russia which demand large volumes. With help of the EFF three new refrigerator warehouses will be built (EUR 8.6 million), investments made in processing and marketing (EUR 14.8 million), on fishing vessels (EUR 6.3 million), in small-scale coastal fishery (EUR 4.5 million), new markets developed and ad campaigns run (EUR 3.6 million). All these activities will improve preservation, processing and handling of fisheries products on ships or in processing plant. In 2008-09, investments on fishing vessels amounted to EUR 1.8 million, developing new markets and ad campaigns EUR 0.9 million, small-scale coastal fishery EUR 0.3 million, processing and marketing EUR 9.4 million.

Markets and trade

Markets

Trends in domestic consumption: Promotional efforts

Practically all trout from aquaculture is sold in the domestic market. Supermarket chains are the main channel for both raw and processed fish. The potential market for salmonids is larger than Estonian domestic production (over 2 000 tonnes consumed annually) and imports from Norway and Finland dominate the market. The Estonian Association of Fishery has carried out campaigns financed through the EFF to promote the consumption of fisheries products. As a result, the average annual consumption of fish and fisheries products is estimated to have grown from 16 kg (2003) to 19 kg (fish as a raw material).

Consumer habits have changed significantly in recent years and consumers pay more attention to product quality and origin. They prefer tinned, smoked and salted products, followed by fresh or chilled and lastly delicacy products and frozen fish.

Trade

Volumes and values

Export figures for 2008 have not changed significantly compared to 2006-07. Imports of canned products grew by 26% and imports of fresh/frozen fish by 11% compared to 2007.

Table 7.4. **Export and import of fresh and canned products (tonnes), 2008-09**

	Export		Import	
	Fresh and frozen fish (group 03)	Canned products (1604; 1605)	Fresh and frozen fish (group 03)	Canned products (1604; 1605)
2008	80 663	40 659	33 180	20 758
2009	88 529	32 070	30 508	10 332

In 2009, fresh and frozen products exports have increased continuously but canned products decreased by approximately 20%. Total export value in 2008 was EUR 95 300, and increased by 3% to EUR 98 000 in 2009. Total imports in 2008 were EUR 89 100 and declined by 25% in 2009 to EUR 67 000.

In addition to EU restrictions, Estonia has not implemented additional restrictions on imports.

Outlook

Improving management of fisheries, including transparency and control of the use of resources, is a major priority in the near future. In fisheries management, the main task is to further balance the fishing effort with resources (especially in coastal fisheries) to allow for longer fishing seasons (if necessary) to meet the demands of the market for a more stable supply of fresh fish.

It is also planned to create more transparent fisheries by making all catch data of individual fishermen fully public and available on-line. It is also necessary to improve controls and enhance the fishers' sense of responsibility.

It is also necessary to monitor and evaluate structural developments of the fisheries sector started in 2008-10. Another task is to widen and diversify the markets and product range, especially in the pelagic sector, and to decrease risks of dependency from few unstable markets.

PART III

Chapter 8

European Union

European Union

Summary of recent events

- The European Union aims at a progressive implementation of an ecosystem-based approach to fisheries management, which contributes to efficient fishing activities within an economically viable and competitive fisheries industry, while minimising the impact of fishing on marine ecosystems.
- For the period 2007-13, a new Council Regulation establishes a European Fisheries Fund (EFF) which succeeds the previous Financial Instrument of Fisheries Guidance (FIFG). The EFF is designed to promote a sustainable European fishing and aquaculture industry. The fund will support the industry as it adapts its fleet to make it more competitive and promote measures to protect and enhance the environment. It will also help fisheries communities most affected by the resulting changes to diversify their economic base.
- In 2008, the European Union recorded a EUR 13.7 billion trade deficit in fishery products, with imports of EUR 16.6 billion and exports of EUR 2.9 billion. Norway is the primary supplier (17% of the EU fishery imports), while Japan, Switzerland, Russia and China are the main destinations of EU fishery exports.
- A new Generalised System of Preferences (GSP) was adopted with Council Regulation (EC) No. 732/2008 of 22 July 2008 applying a scheme of generalised tariff preferences for the period from 1 January 2009 to 31 December 2011 and amending Regulations (EC) No. 552/97, (EC) No. 1933/2006 and Commission Regulations (EC) No. 1100/2006 and (EC) No. 964/2007.
- On 10 October 2007, the European Commission adopted an Integrated Maritime Policy for the European Union.[1] The EU Integrated Maritime Policy (IMP) has established itself as new approach to enhance the optimal development of all sea-related activities in a sustainable manner. It has confirmed the vision that, by joining up policies towards seas and oceans, Europe can draw much higher returns from them with a far lesser impact on the environment. EU institutions, Member States and regions have set-up governance structures to ensure that policies related to the seas are no longer developed in isolation and take account of connections and synergies with other policy areas.
- Since January 2010, compliance with conservation and management rules will govern our external trade with fishery products under the IUU Regulation. This is a major change compared to the current situation where the regulatory framework for the external trade with fishery products is essentially influenced by customs and sanitary rules and, to a minor extent, by conservation and management rules.

Legal and institutional framework

The institutional framework has changed following the adoption of the Lisbon Treaty on 13 December 2007 which entered into force on 1 December 2009. The term "European Community" is replaced by the "European Union". This change does not particularly affect fisheries. On the basis of the Treaty on the Functioning of the European Union (Article 3 and Articles 38 to 44), as provided until 30 November 2009 by the Treaty establishing the European Community (Article 3 and Articles 32 to 38), the European Union has exclusive competence for conservation and management of marine fish stocks. The European Union

therefore has responsibility for the adoption of all relevant rules in this area – which are then implemented by the Member States – and for entering into external agreements or arrangements with third countries or qualified international organisations.

The European Union's competences include fishing activities in waters under national jurisdiction and on the high seas. However, measures relating to the exercise of jurisdiction over fishing vessels, the right of such vessels to fly the flag and the registration of fishing vessels fall within the competence of the Member States, under the conditions laid down in the EU legislation.

Responsibility for a number of policy areas, which are not directly related to the conservation and management of fishery resources, such as research, technological development and development co-operation, is shared by the European Union and Member States. This is also the case for issues related to biodiversity and environment when they are not directly related to conservation and management.

Council Regulation (EC) No. 2371/2002 of 20 December 2002[2] on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy provides for a legal framework on the basis of which fisheries management is conducted under the Common Fisheries Policy (CFP).

The 2002 reform of the CFP provided for greater and earlier involvement of stakeholders in the CFP process through the creation of the Regional Advisory Councils (RACs). In July 2004, the Council adopted a Decision to create seven RACs concerning specific fishing areas or fisheries[3] which have been put in place as follows: the North Sea RAC (November 2004), the Pelagic RAC (August 2005), the North Western Waters RAC (September 2005), the Baltic Sea RAC (March 2006), the Long Distance RAC (March 2007), the South Western Watters RAC (April 2007) and the Mediterranean RAC (April 2009). In 2007,[4] RACs were declared as bodies pursuing an aim of general European interest entitling them to non-digressive funding.

Since the establishment of RACs, the Commission has launched several consultations and has received more than 350 recommendations on important issues, either of a regional character (North Sea RAC and North Western Waters RAC advice on cod recovery plan) or on broader policy issues such as the future reform of the CFP. RACs contribution to the evaluation and preparation of long term management plans has also been very constructive and useful. In June 2008, the Commission adopted a report on the functioning of RACs.[5]

The integrated maritime policy

The October 2007 Blue Paper set out an ambitious Action Plan[6] which includes new working methods, cross-cutting tools and a wide range of specific actions that aim to improve the maritime economy, protect and restore the marine environment, strengthen research and innovation, foster development in coastal and outermost regions, provide leadership in international maritime affairs, and raise the visibility of Europe's maritime dimension.

Essentially, the framework provided by the IMP seeks to achieve four objectives:

- to promote integration of governance structures by making them more inclusive and co-operative;
- to build the knowledge base and cross cutting tools necessary to enable the implementation of integrated policies;
- to improve the quality of sectoral policies, through an active search for synergies and increased coherence across sectors;

- to take account of specificities of the regional seas around Europe, through tailor-made strategies and solutions.

The Progress Report,[7] published by the European Commission in October 2009, shows that the implementation of the Action plan has progressed well.

The main achievements are summarised as follows.

Maritime governance and stakeholder involvement

The Blue Paper called for a major re-think of our governance approach towards seas and oceans at all levels of government: EU institutions, Member States and regions. Political actors have, on the whole, been very responsive to this approach: two years on, steps have been taken throughout the Union to overcome the compartmentalised nature of several sea-related policies, involve maritime stakeholders more broadly, and identify policy synergies.

Cross-sector tools

The Blue Paper identified the need for cross-cutting tools to underpin the IMP, such as: maritime spatial planning, integrated surveillance, and the building of a marine knowledge base. The development of these three tools has progressed well and first important results can be reported.

Maritime Spatial Planning (MSP) and Integrated Coastal Zone Management (ICZM)

The Commission adopted the "Roadmap on Maritime Spatial Planning: Achieving Common Principles in the European Union" in 2008.[8] It sets out ten key principles and seeks to discuss the development of a common approach among Member States encouraging the implementation of MSP at national and EU level.

The Commission also launched two preparatory actions in the Baltic Sea (as part of the EU Strategy for the Baltic Sea Region) and the North Sea/North East Atlantic, aiming at developing cross-border co-operation aspects of MSP, as well as a study on the potential of maritime spatial planning in the Mediterranean Sea and the economic benefits of MSP.

Following the recommendation in the Commission's Blue Paper to set up a system for exchange of best practices in developing Integrated Coastal Zone Management (ICZM), the Commission launched in 2009 a support project to stimulate the sharing of best-practice and promote effective implementation of ICZM.[9] The Council signed at the end of 2008 the Protocol on Integrated Coastal Zone Management under the Barcelona Convention.

Integration of maritime surveillance

The Communication: "Towards the Integration of Maritime Surveillance in the European Union"[10] builds on the work to date and sets out guiding principles for building a common information sharing environment (CISE) for the EU maritime domain, based on existing and new surveillance capacities including pre-operational GMES services.

This CISE is to allow for restricted data exchange between seven user communities:

1. Maritime Safety[11] (including Search and Rescue), Maritime Security[12] and prevention of pollution caused by ships.[13]
2. Fisheries control.
3. Marine pollution preparedness and response; Marine environment.
4. Customs.[14]

5. Border control.[15]

6. General law enforcement.[16]

7. Defence.

Work that includes all these communities at Member State level is in progress according to the CISE Roadmap and to Commission Communication Com(2010) 584 of 20 October 2010.

Building a marine knowledge base

The European Marine Observation and Data Network (EMODNET) aims to reduce uncertainty in knowledge of the seas as well as operational costs for those who use marine data. Existing databases and observation programmes need to be assessed in terms of coverage, resolution and data collection frequency. Data stemming from different sources should be compiled in a comprehensive and compatible way, and made accessible as a tool for better governance.

Sea basin strategies

The European Union has embraced a sea-basin approach for the implementation of the IMP. Its core principle is that each sea-region is unique and needs individual attention in balancing its uses in a sustainable manner. The strengthening of co-operation within these sea regions is therefore an important building block for a successful implementation of the IMP.

So far, regional approaches have been put forward by the Commission for the Arctic and the Mediterranean Sea, and a strategy was launched for the Baltic Sea.

Thus, the Communication on "The European Union and the Arctic Region"[17] presents specific proposals in order to protect and preserve the Arctic in unison with its population, promote the sustainable exploitation of resources and improve multilateral governance. The Commission intends to enhance its input to the Arctic Council and to strengthen Dialogue with the Arctic States and related stakeholders.

In June 2009, the Commission proposed the EU Strategy for the Baltic Sea Region.[18] This is the first EU macro-regional strategy, addressing environmental challenges, energy and transport related issues, economic growth potential, as well as safety and security issues. With its strong maritime dimension and its integrated approach, the Strategy is an important first step towards the regional implementation of the IMP in the Baltic. It will help meet the challenges in the region, not only through strengthened internal co-ordination within Member States, but also through cross-border networks and good co-operation with Russia.

The Commission's Communication on the Mediterranean[19] outlines ways forward for an integrated maritime policy in the complex political context of the region. As a semi-enclosed sea with very densely populated shores, the Mediterranean can only be managed through increased dialogue and co-operation amongst EU Mediterranean Member States as well as with non-EU coastal States. The Communication includes options to improve governance of maritime affairs and to ensure a greater involvement of coastal States in managing the marine space.

Capture fisheries

Status of fish stocks

In many sectors, conservation policy is not delivering on sustainability issues. Most demersal stocks have declined and are not sustainable, being exploited outside safe biological limits. Species such as capelin and sandeel that are used to make fish meal have been scarce.

The Bluefin tuna population is overexploited and there is a serious control problem. Whilst Atlantic swordfish stocks are healthier, the Mediterranean stock is considered to be overfished. In the Mediterranean and the Black Sea, the number of stocks monitored and assessed has been steadily increasing in the recent years up to a maximum of 60 stocks; most of the assessed stocks (from more than 50 to 90% depending on the groups of stocks) are considered overexploited and in some cases with stocks size below safety conditions.

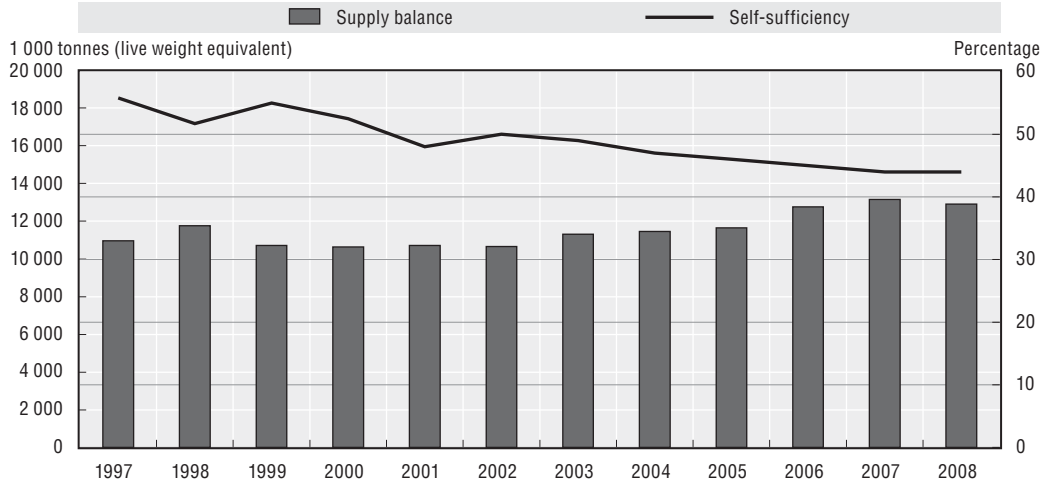
There is some good news concerning the state of fish stocks:

- the number of stocks that are not overfished has climbed from 2 in 2005 to 11 in 2010;
- 20 stocks were subject to a "stop fishing" recommendation; these have decreased to 14;
- stocks outside safe biological limits (but not subject to a "stop fishing" recommendation) have dropped from 30 in 2003 to 22 in 2010;
- while total allowable catches (TACs) are still set at much higher levels than those recommended by scientists, they have dropped from 47 to 34% in 2010.

However, there are more stocks (42, up from an average of 35) where scientists have not provided recommendations due to concerns about the quality of the data or for other reasons. These include megrims, cod and sole in the Celtic Sea and sole in the western channel. Nonetheless, progress has been made in assessing the Nephrops stocks.

While there are signs of improvement, this is only a beginning. Success in recovering stocks is far from guaranteed and efforts to eliminate overfishing must be continued. Recurrent and regular overfishing has led to a situation where the fish stocks in EU waters contribute much less to the European economy and to the food supply than they did in the past. This reduction in productivity has led to increased dependence on imported raw materials for the European food industry and for the European market. While 75% of fish products for the European market originated from domestic resources in the early 1970's, domestic products now only contributes some 40% (Figure 8.1).

Figure 8.1. **Evolution of the supply balance of the European Union (1997-2008) in volume (tonnes of fish)**



Source: Eurostat.

Management of commercial fisheries

The **TACs** and **quotas** allocated to each Member State are laid down in Regulations 43/2009, 40/2008,[20] 1404/2007,[21] and Regulations 1579/2007[22] for 2008 and 1139/2008[23] for 2009 in the Black Sea. For the Baltic Sea, Regulation 1322/2008 of 28/11/2008 applies. The TACs, allocations by Member States and captures made in 2008 are reported in Annex 8.A1.

Several Commission Regulations were adopted for both 2008 and 2009 on the adjustment of fishing quotas, following quota overfishing or use by some Member States of the flexibility given by Regulation 847/96 introducing additional conditions for year-to-year management of TACs and quotas.

Deep Sea fisheries: On 18 December 2009, the Commission opened a public consultation on regarding the future of the regulatory regime of fisheries exploiting deep sea stocks. The Commission proposed that the deep sea fisheries framework regulations Council Regulation 2347/2002[24] be revised and explores possible options in this regard. The Commission intends to table proposals to this end during 2011.

Multi-annual plans: The Community aims to progressively apply an ecosystem-based approach to fisheries management, which should contribute to efficient fishing activities within an economically viable and competitive fisheries industry, while minimising the impact of fishing on marine ecosystems. The assessment of the Commission is based on scientific advice, mainly from the International Council for the Exploration of the Sea (ICES).

The Council has so far adopted **recovery and management plans** for the following stocks: Northern hake stock (adopted in April 2004), Cod in the North Sea, west of Scotland and Irish Sea (adopted in December 2008), Southern hake and Norway lobster stocks in Cantabrian Sea and Western Iberian peninsula (adopted in December 2005), sole in the Bay of Biscay (adopted in February 2006), sole in the western Channel (adopted in may 2007), North Sea sole and plaice (adopted in June 2007), European eel (adopted in September 2007), Baltic cod (adopted in September 2007) and Bluefin tuna in the Mediterranean and eastern Atlantic (adopted in December 2007). A recovery plan for Greenland Halibut in Northwest Atlantic Fisheries was adopted by the Council in December 2005. Council Regulation (EC) 1300/2008 was adopted on 18 December 2008, establishing a multi-annual plan for the stock of herring distributed to the west of Scotland and the fisheries exploiting it.

The Commission carried out the revision of the recovery plan for cod in the North Sea, west of Scotland and Irish Sea. In 2008, in the light of new scientific advice, amended recovery measures for the stocks were proposed and adopted by the Council [Council Regulation (EC) No. 1342/2008 of 18 December 2008].The Commission has also evaluated the recovery plan for the Southern hake and Norway lobster stocks [COM(2011) 260 final] and is evaluating options for its improvement during 2011.

The recovery plan was extended to include the Celtic Sea area.

Two proposals were adopted by the Commission in 2009:

- COM/2009/399: proposal for a Council Regulation establishing a long-term plan for the anchovy stock in the Bay of Biscay and the fisheries exploiting that stock;
- COM/2009/189: proposal for a Council Regulation establishing a multi-annual plan for the western stock of Atlantic horse mackerel and the fisheries exploiting that stock.

Fishing effort: Following the effort management system established by Regulation 1954/2003 in western waters,[25] effort ceilings were set in July 2004 for fisheries covered by this regulation which remain in force until present. Effort limitations in the form of

maximum days at sea were also set for fisheries covered by the multi-annual plans for cod in the North Sea, west of Scotland and Irish Sea, sole and plaice in the North Sea, sole in the western Channel, southern hake and Nephrops (Iberian peninsula) and sandeel in the North Sea. These effort limitations were implemented annually in the annex of the TAC and quota regulations since the adoption of the respective multi-annual plans. Similarly, effort is regulated in Baltic cod fisheries in the context of the Baltic cod recovery plan.

The Commission has evaluated Regulation 1954/2003 and will assess options for revision during 2011.

Since 2007, the European Union has streamlined and simplified the methods of effort limitations, starting in 2008 with voluntary effort management by kW-days under the cod recovery plan.

The Recovery Plan for Bluefin tuna put in place a strict control system to ensure respect of the allocated quota. To ensure the balance between the fishing effort of the EU fleet and the quotas, the European Union implemented annual fishing plans identifying vessels over 24 metres fishing for Bluefin tuna and their individual quota.

The **access restrictions**, specifically in the Shetland Box and Plaice Box were not changed, after the debate that followed the issuing of a Communication from the Commission to the Council and the European Parliament.

Technical measures: In the Atlantic and North Sea, a number of new measures have been introduced in addition to technical measures contained in Regulation 850/1998 and in separate recovery plans for cod and hake. In 2007, a prohibition of gillnets, entangling nets and trammel nets in depths below 200 metres was introduced for ICES Zones IIIa, IVa, VI, VII and XII and was primarily put in place to protect deepwater shark species. The ban was extended to include zones VIII, IX and X in 2009. A number of permanent closed areas that protect vulnerable deep-sea habitats in EU waters off the west coast of Ireland and in international waters were also introduced in 2008. In addition, over the period 2007-10, seasonal closures were introduced in the Celtic Sea to protect cod, to the West of Scotland to protect Blue ling and in the Porcupine Bank to protect *Nephrops*.

In 2009, restrictions on fishing for cod, haddock and whiting in ICES Zone VI were introduced under Annex III of Regulation 43/2009. These restrictions applied in an area inside the 200 metres depth contour in ICES Division VIa and included increases in mesh size, changes to allowable catch compositions, the mandatory use of square mesh panels and sorting grids and a ban on the use of certain gear types.

In the North Sea and Skagerrak, a mandatory ban on high-grading was introduced in 2009 under Regulation 1288/2009 for all quota species, while Member States were also encouraged to apply similar restrictions in the Eastern English Channel on a voluntary basis. In 2010, this "voluntary" highgrading ban was extended to cover all EU waters in the Atlantic Area.

Baltic Sea: A Regulation on conservation of fishery resources through technical measures in the Baltic Sea, the Belts and the Sound was adopted in December 2005. Regulation 2187/2005 included measures related to selectivity of the gears, mesh sizes, restrictions of certain gears and in certain areas and minimum landing size. This regulation was amended by Commission Regulation 686/2010, which simplified these technical measures. A high-grading ban was also introduced into the Baltic in 2009 under Regulation 1266/2009.

Mediterranean and Black Sea: Council Regulation 1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea was adopted in 2006. This regulation sets the new framework for fisheries management in the Mediterranean including specific provisions on the protection of vulnerable species and habitats, sets minimum technical rules for the size and the use of fishing gear and minimum sizes for commercial species and requires Member States to establish a network of fisheries protected areas to protect nursery areas, spawning grounds or marine ecosystems in general. It follows in a comprehensive manner an ecosystem approach as laid down in 2002 reform as one of the basic objectives of the reformed CFP.

Since the accession of Bulgaria and Romania to the European Union on 1 January 2007, the CFP also applies to the Black Sea. As a first step conservation measures TACs and quotas and some technical measures have been set in for 2008, 2009 and 2010 for sprat and turbot.

In 2004, a Regulation on technical measures for the conservation of certain stocks of highly migratory species was adopted by the Council. In 2006, the Commission put forward a proposal for a new Council Regulation on this same issue. This proposal seeks to update the EU rules transposing the technical conservation measures adopted within the regional fisheries organisations (RFOs), responsible for the management and conservation of tunas and related species in the Atlantic and the Mediterranean. Measures would apply in different areas, restrictions would mainly apply to the use of certain types of vessels and gears, minimum sizes, restrictions on the number of vessels, species not targeted and sport fishing.

Fleet management

Fleet management is one of the main aspects of the Common Fisheries Policy (CFP).

EU law defines fishing capacity based on the fishing vessel's characteristics. More precisely, the capacity of a fishing vessel is expressed in terms of both its tonnage (GT) and the power (kW) of its main engine. The EU fleet at 31 December 2010 consisted of 83 787 vessels with an overall capacity of 1 752 905 GT and 6 542 786 kW. These figures include fishing vessels registered on the continent and in the outermost regions.

Since the end of 2002, when the current CFP was adopted, fleet management is regulated by Chapter III of Council Regulation 2371/2002 and Commission Regulation 1013/2010. According to these rules, no capacity reduction targets are decided at EU level. The reform of the CFP in 2002 also put an end to public aid for the construction of vessels and for the export of capacity to third countries.

Member States are responsible for adjusting the size of the fleet to the fishing opportunities allocated to them, be it in the form of quotas or fishing effort. For example, when effort reductions are established in the context of multi-annual plans adopted for the relevant stocks, Member States decide on whether to implement them by means of cutting activity, capacity or both.

Nevertheless, each Member State fleet is subject to strict fishing capacity management measures that can be summarised as follows:

a) any entry of capacity has to be compensated by the exit of at least an equivalent capacity, measured both in terms of tonnage and power;

b) the capacity withdrawn (scrapped) with public aid cannot be replaced. Most of the capacity scrapped with public aid is expected to come as a result of the recovery plans.

These rules imply that the capacity of the EU fleet should decrease steadily over time and this has indeed been the case.

Nevertheless, after eight years, the capacity management regime is judged to be only partially successful. Although capacity rules for the fleet of all Member States are now simpler and easier to enforce, the overall result is that the capacity reductions achieved are still modest compared with what would have been needed to achieve a healthy balance between the size of the fleet and the fishing resources. The main instrument to allow a close follow-up of the evolution of the EU fleets by Member State is the Annual Report issued on the basis of Article 14 of Regulation 2371/2002 but the reporting by Member States does not allow the Commission to provide with a quantitative assessment of the adequate fleet size.

The EU Fishing Fleet Register,[26] which was first set up in 1990, has evolved and its role has been strengthened as an instrument for fleet management. All fishing vessels of the EU Member States are registered and the data available include fishing vessel identification, physical and technical characteristics, fishing gear, owner and agent information.

Fight against illegal, unreported and unregulated (IUU) fishing

On the basis of a proposal by the Commission tabled in October 2007, the Council adopted a new comprehensive EU policy against IUU fishing via Regulation 1005/2008, which applies from 1 January 2010.

This Regulation establishes a new regime governing the access to the EU territory of third country fishing vessels and trade of fisheries products. Only fisheries products certified as legal by the Flag State concerned are allowed into EU territory.

Via blacklists, the European Union may identify States hosting Flags of non compliance and vessels responsible for IUU fishing. Subsequent corrective *t* measures can be applied.

Finally, the Regulation also contains specific provisions designed to enhance compliance of EU operators with applicable rules, through provisions on the identification and sanctioning of EU nationals involved in IUU fishing and increased level of sanctions.

Bilateral agreements

Fisheries Partnership Agreements (FPA) are negotiated and concluded by the Commission, on behalf of the European Union. Under an FPA, the EU obtains access to a third country's exclusive economic zone (EEZ) for EU vessels which may carry out fishing activities. In return, the European Union provides a financial contribution based on two elements: the economic evaluation of the access by Community vessels to third country waters and fisheries resources, and the needs expressed by the partner country for supporting the implementation of a sustainable fisheries policy in its waters.

There are currently 15 FPAs in force, which can be divided into two categories: 11 bilateral tuna agreements (with Cape Verde, Ivory Coast, Gabon, São Tomé and Principe, Mozambique, Madagascar, Comoros, Seychelles, Kiribati, Micronesia and the Solomon Islands) and four multi-species agreements with Greenland, Mauritania, Guinea Bissau and Morocco. All in all, during 2004-08, an average of 312 vessels fished under the FPAs, 166 of them fishing tuna, 135 targeting demersal species and 10 pelagic trawlers. Through FPAs, the European fleet has access to surplus resources which its partners cannot or do not wish to fish, in accordance with UN principles. Each FPA is an "exclusive" agreement: once it is in place, EU vessels can only fish under the FPA, and cannot enter into private agreements with the partner country except under certain conditions.

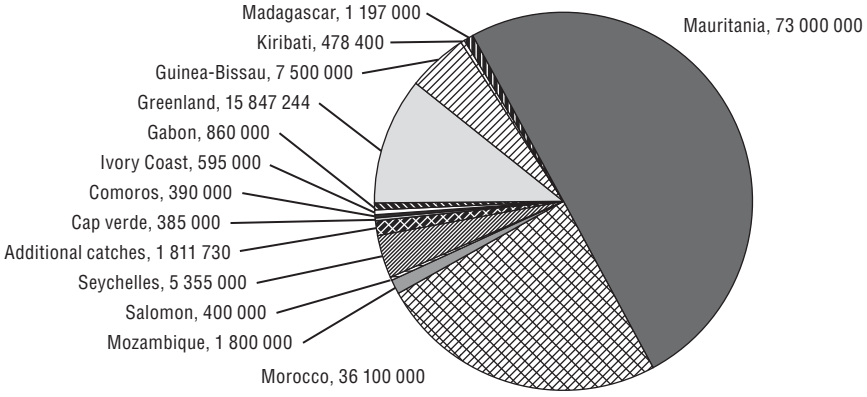
In 2009, the FPA with the Solomon Islands was successfully renegotiated while two others (with Mauritius and Guinea) have been discontinued with the effect that the

geographical area covered by FPAs for the EU fleet has been reduced. The dialogue with Mauritius did not achieve the common ground needed to successfully negotiate a new agreement, while the *coup d'état* in Guinea in September 2009 led the European Union to withdraw the proposal for a new FPA initialled in December 2008.

In 2010, 5 FPAs were successfully renegotiated with Micronesia, São Tome and Principe, Comoros, Seychelles and Cape Verde with the entry into force of these new protocols being planned for 2011.

In 2010, the total amount committed and paid in respect of International Fisheries Agreements was respectively EUR 145 329 374 and EUR 136 615 179. Figure 8.2 provides details on budgetary commitments per agreement in 2010.

Figure 8.2. **Fishery Partnership Agreements – Budgetary commitments 2010**



Multilateral agreements and arrangements

The European Union has substantially contributed to the work in the area of fisheries of international organisations such as the UN, the OECD and the FAO and of 16 established and evolving Regional Fisheries Organisations (RFOs). The development of a harmonised approach within many of these RFOs regarding the treatment of illegal fishing and the development of multi-annual management regimes for stocks managed by them has been an objective of the European Union.

Within FAO, the European Union has actively participated in the negotiations of the FAO Port States Agreement which was adopted in November 2009. In February 2009, the Commission adopted and communicated to the FAO a Community Plan of Action for the Conservation and Management of Sharks, following the FAO IPOA Sharks. The European Union is currently pursuing the ratification of the FAO PSM Agreement.

In RFMOs, the European Union has been a key factor in the implementation of new regime for the management of deep sea fisheries, notably with a view to prevent bottom fishing activities from damaging vulnerable marine ecosystems.

Aquaculture

Policy changes

In April 2009, the European Commission adopted its Communication "Building a Sustainable Future for Aquaculture – A New Impetus for the Strategy for the Sustainable Development of European Aquaculture".[27] The Council welcomed this Communication

and adopted Council Conclusions on a Strategy for the Sustainable Development of European Aquaculture in June 2009.

The Commission also adopted detailed rules on organic aquaculture animal and seaweed production,[28] as well as a proposal for legislation exempting biosecure "closed aquaculture facilities" from the permit requirement.[29]

Production facilities, values and volumes

Total aquaculture production in the EU27 reached approximately 1.3 million tonnes, worth some EUR 3 billion in 2007. There are some 14 400 aquaculture firms in the European Union. Regarding the structure of the sector, the vast majority of the enterprises are SMEs. A small number of larger enterprises play an important role in some specific sub-sectors, particularly for salmon and sea bass/sea bream industries. Direct employment in the EU aquaculture sector is approximately 65 000 full-time jobs.

Fisheries and the environment

The CFP reform approved in December 2002 is a turning point in fisheries management. The new CFP focuses more on the impact of fisheries on the environment and encourages sustainable development.

The main legal instrument driving the reformed CFP is the Framework Regulation, (EC) No. 2371/2002, on the conservation and sustainable exploitation of fisheries resources under the CFP. According to this Regulation, "the Community shall apply the precautionary approach in taking measures designed to protect and conserve living aquatic resources, to provide for their sustainable exploitation and to minimise the impact of fishing activities on marine ecosystems".

Policy changes in response to environmental concerns that have affected fisheries management and fishers' behaviour.

The process to integrate interactions between fisheries and marine ecosystems into the workings of the Common Fisheries Policy (CFP) went through several stages which have been described in previous EU reports to the OECD.

In the context of the developments in UNGA and related bodies on high seas bottom fishing (UNGA Resolution 61/105), the Commission adopted in the autumn 2007 an EU strategy on the protection of vulnerable marine ecosystems from the adverse impacts of high seas bottom fishing gears. On this basis, the EU participated actively in the definition of new regimes for high seas bottom fishing in the competent RFMOs (NEAFC, NAFO, CCAMLR, GFCM, SEAFO), and the Council adopted EU Regulation 734/2008 of 15 July 2008 which applies to high seas areas which are not managed by any RFMO competent to regulate bottom fishing nor by multilateral interim measures.

In 2004, specific measures were introduced to reduce incidental catches of cetaceans by fishing vessel. Regulation 812/2004 identifies fisheries where the use of acoustic deterrent devices, also known as pingers, is mandatory and fisheries where at-sea observer schemes need to be in place. In 2009, the Commission reviewed this regulation.

The aim of the EU's ambitious Marine Strategy Framework Directive (adopted in June 2008) is to protect more effectively the marine environment across Europe. It aims to achieve good environmental status of the EU's marine waters by 2021 and to protect the resource base upon which marine-related economic and social activities depend. The Marine Strategy Framework Directive constitutes the vital environmental component of

the Union's future maritime policy, designed to achieve the full economic potential of oceans and seas in harmony with the marine environment.

Government financial transfers

Since 1 January 2007, the European Fisheries Fund (EFF) replaced the previous Financial Instrument for Fisheries Guidance (FIFG). EFF is designed to secure a sustainable European fishing and aquaculture industry. The fund will support the industry as it adapts its fleet to make it more competitive and also promote measures to protect and enhance the environment. It will also help fisheries communities most affected by the resulting changes to diversify their economic base.

The EFF will run for seven years (2007-13), with a total budget of EUR 4 305 million. Funding is available for a broad range of sectors of the fishing industry, such as sea and inland fisheries, aquaculture businesses, producer organisations, and the processing and marketing sectors. The detailed rules for the implementation of the EFF are laid down in Commission Regulation (EC) No. 498/2007.

The main objective of the EFF is to grant financial support to the European fishing industry, during the period 2007-13, and help it to adapt to the economic environment and needs. The Fund focuses particularly on:

- Supporting the major objectives of the Common Fisheries Policy (CFP), particularly those agreed during the reform of the policy in 2002. This implies a sustainable exploitation of fisheries resources and achieving a stable balance between these resources and the capacity of EU fishing fleet.
- Strengthening competitiveness and viability of operators in the sector.
- Promoting environmentally-friendly fishing and production methods.
- Providing adequate support to people employed in the sector.
- Fostering the sustainable development of fisheries areas.

EFF targets five priority areas. These reflect the EFF's task of facilitating the implementation of measures adopted under the reform of the CFP to secure economic, environmental and social sustainability in fisheries. The five EFF priorities are as follows:

1. adaptation of the EU fishing fleet;
2. aquaculture, inland fishing, processing and marketing of fisheries and aquaculture products;
3. measures of collective benefit;
4. sustainable development of fisheries areas; and
5. technical assistance to facilitate the delivery of assistance.

***De minimis* state aid** [Commission Regulation (EC) No. 875/2007 of 24 July 2007] is aid deemed not to distort competition. Under the Regulation, the ceiling is set at EUR 30 000 per three-year period, per beneficiary, on condition that the total amount of such aid represents less than 2.5% of the annual national fisheries output. None of this aid may be used to purchase or construct new vessels, or to enhance existing fleet capacity, to ensure that the overarching objective of the CFP to obtain a better balance between fishing fleet capacity and available fisheries resources is not compromised. Member States will have to record all relevant information to show that these conditions have been respected.

Post harvesting policies and practices

Food safety

Food Safety Legislation at EU level with relevance for fisheries and aquaculture

The period 2008-09 saw a significant development of the European Union's secondary legislation (Regulations and Decisions) regarding food safety; with much of it relevant to fisheries and aquaculture. The entry into force of the Lisbon Treaty on 1 December 2009 resulted in a change to the primary legislation. The term, European Union, replaces and succeeds the European Community. The provisions on food safety in the new primary legislation reflect closely those which existed in the European Community Treaty.

Hygiene Package

- Amendments to Regulation (EC) No. 853/2004 on the hygiene of foodstuffs.
  - *Commission Regulation (EC) No. 1020/2008* – clarifies which parts of the Annex on Fishery Products applies to retail; allows in addition to potable water and clean water the use of clean seawater to be used for the handling and washing of fishery products, for making ice and for cooling shellfish after cooking. It introduces new provisions concerning the heading and/or gutting of fish on board vessels and for shelling and shucking shellfish; clarifies requirements for raw material conditions for production of fish oils for human consumption and allows fishery products from *Gempylidæ* to be placed on the market under stated conditions.
- Amendments to Regulation (EC) No. 854/2004 on official controls.
  - *Regulation (EC) No. 1021/2008* – provides for tolerances for the numbers of *E. coli* detected in bivalve molluscs from class B areas and provides for checks on frozen *Gempylidæ*.
  - *Regulation (EC) No. 219/2009* – specifies that only potable water and in certain circumstances clean water to be used to remove surface contamination from products of animal origin (including fish), any other substance must be specifically approved. It also sets out the future decision making procedure for possible amendments to the hygiene rules regarding processing treatments of certain live bivalve molluscs (LBMs), testing methods for marine biotoxins, additional health standards for LBMs and extension of provisions for harvesting *Pectinidæ*, outside classified production areas, to other LBMs.

Contaminants

- Amendments to (framework legislation) Regulation (EEC) No. 315/93 laying down Community procedures for contaminants in food.
  - *Regulation (EC) No. 596/2009* – specifies how the Commission is to act in the examination of information from Member States regarding contaminants and makes certain changes regarding assistance to the Commission from the Standing Committee on the Food Chain and Animal Health.
- Amendments to Regulation (EC) No. 1881/2006 setting maximum levels for certain contaminants in food.
  - *Regulation (EC) No. 565/2008* – introduces a maximum limit for dioxins and dioxin-like PCBs for fish liver.
  - *Regulation (EC) No. 629/2008* – permits higher cadmium limits for certain species or species groups of fish (mackerel –0.10 rather than 0.050 mg/kg, bullet tuna –0.20 rather

than 0.050 mg/kg, and anchovy 0.30 rather than 0.10 mg/kg); in the case of maximum limits for mercury adds an additional species of fish to the higher of two bands.

Import lists

- Amendments to Decision 2006/766 establishing the list of third countries and territories from which LBM and fishery products are permitted.
- *Decisions 2008/156/EC and 2009/951/EU* – Extension of the list for fishery products from 92 to 101 (fully harmonised) countries/territories.

Animal nutrition – aquaculture

New legislation introduced on the marketing of feed materials and compound feed – Regulation (EC) No. 767/2009 of 13 July 2009 on the placing on the market and use of feed.

TSE/BSE

An amendment to Regulation 999/2001 was decided giving authorisation for the use of fishmeal in milk replacers intended for feeding to young animals of ruminant species – Regulation (EC) No. 956/2008 of 29 September 2008 amending Annex IV to Regulation (EC) No. 999/2001 laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies.

Animal By-products

A new Regulation was decided repealing previous legislation dating from 2002 – Regulation (EC) No. 1069/2009 of 21 October 2009 laying down health conditions as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No. 1774/2002. The new rules apply from March 2011.

Organic farming – aquaculture

New details were decided for aquaculture animals and seaweed in 2009 – Regulation (EC) No. 710/2009 amending Regulation (EC) No. 889/2008 (detailed rules for agriculture and labelling) laying down rules for the implementation of Regulation (EC) No. 834/2007, as regards laying down detailed rules on organic aquaculture animals and seaweed production. The new rules apply from 1 July 2010.

Markets and trade

Common organisation of markets

Guide prices: Council Regulation (EC) No. 1299/2008 of 9 December 2008 fixing the guide prices for 2009 and six ancillary Commission Regulations (EC) No. 1306 to 1311/2008 of 19 December 2008 fixing the intervention parameters for 2009. Council Regulation (EC) No. 1212/2009 of 30 November 2009 fixing for the 2010 fishing year the guide prices and six ancillary Commission Regulations (EC) No. 1276 to 1281/2009 fixing the intervention parameters for 2010. *Market intervention:* In 2008 and 2009, EUR 14.9 million and EUR 14.4 million, respectively, were spent for market intervention.

Trade

Trends

In 2008, the EU trade deficit in fishery products dropped to EUR 13.7 billion (EUR 14 billion in 2007), with imports of EUR 16.6 billion and exports of EUR 2.9 billion. Norway maintained its position as primary supplier, though its share in total EU imports went down (17% in 2008 *versus* 20% in 2007). Japan (11%), Switzerland (10%) Russia (9%) and China (8%) are the main destinations of EC fishery exports. For individual performances of EU Member States, Spain was in 2008 the main importer (19%) but also exporter of fish products. On the import side, Spain was followed by the United Kingdom (12%) and Germany (10%). On the export side, Denmark ranked second (17%), while the Netherlands was the third largest exporter with 15% of total exports.

Legislation

Trade measures in support of conservation: Council Regulation (EC) No. 1005/2008 to prevent, deter and eliminate illegal, unreported and unregulated fishing (the IUU Regulation) was adopted on 29 September 2008 and entered into force on 1 January 2010.

As foreseen in the IUU Regulation, the European Commission adopted an Implementing Regulation (Commission Regulation No. 1010/2009 of 22 October 2009) laying down technical details of certain provisions in the IUU Regulation including the following.

- prior notification of landings, transhipments and consignments (Articles 1 and 2);
- landing and transhipment declarations (Article 3);
- benchmark criteria for port inspections (Articles 4 and 5);
- simplified catch certification scheme for fishery products with specific characteristics (catches obtained by small fishing vessels, Article 6);
- list of recognised catch documentation schemes in Regional Fisheries Management Organisations (Article 7);
- deadlines for the submission of catch certificates (Article 8);
- approved economic operators (Articles 9 to 30);
- risk management criteria for verifications related to catch certificates (Articles 31 and 32);
- administrative co-operation with third countries concerning catch certificates (Article 33);
- sighting reports (Article 34);
- mutual assistance (Articles 35 to 52);
- amendments to the list of excluded products (Article 53).

The Commission Regulation was amended on 29 January (No. 86/2010) to revise the list of excluded fishery products and include administrative arrangements with third countries. A second amendment was introduced on 28 May 2010 (No. 468/2010) establishing an EU list of vessels engaged in IUU fishing.

Free trade agreements: The Caribbean region (CARIFORUM) signed a comprehensive regional EPA so far (Council Decision 2008/805/EC of 15 July 2008 on the signature and provisional application of the Economic Partnership Agreement between the CARIFORUM States, of the one part, and the European Community and its Member States, of the other part). *Generalised System of Preferences:* new Generalised System of Preferences (GSP) adopted with Council Regulation (EC) No. 732/2008 of 22 July 2008 applying a scheme of generalised

tariff preferences for the period from 1 January 2009 to 31 December 2011 and amending Regulations (EC) No. 552/97, (EC) No. 1933/2006 and Commission Regulations (EC) No. 1100/2006 and (EC) No. 964/2007. With the Commission's Decision on the GSP+ beneficiary list for 2009-11 adopted on 9 December 2008 (Decision 2008/938/EC), the process of reviewing and deciding on all applications was completed. 16 beneficiary countries have qualified for the scheme 2009-11 as compared to 14 countries for the period 2006-08.

Autonomous tariff reductions: adoption of Council Regulation (EC) No. 1897/2006 of 19 December 2006 amending Regulation (EC) No. 1255/96 temporarily suspending the autonomous common customs tariff duties on certain industrial, agricultural and fishery products.

Autonomous tariff quotas: by way of Council Regulation (EC) No. 824/2007 of 10 July 2007 a new tri-annual regime of autonomous tariff quotas for the period 2007 to 2009 was introduced.

Outlook

A major policy initiative will be the launching of proposals to reform the Common Fisheries Policy (CFP). The proposals should build on the results of an extensive public consultation on the "Green Paper on the Reform of the CFP".

The reform package will also include a proposal for an overhaul of the Common Organisation of the Markets in fisheries and aquaculture products.

The new Integrated Maritime Policy has six strategic policy orientations for the future:

1. integration of maritime governance;
2. development of cross-cutting policy tools;
3. definition of limitations to maritime activities as necessary in order to guarantee sustainability;
4. development of sea-basin regional strategies;
5. development of the international dimension of the Integrated Maritime Policy;
6. renewed focus on sustainable economic growth, employment and innovation.

Notes

1. COM(2007) 575 final of 10/10/2007 and SEC(2007) 1278 of 10/10/2007.
2. *Official Journal*, L 358, 31/12/2002, pp. 0059-0080.
3. Council Decision 2004/585/EC of 19 July 2004 establishing Regional Advisory Council under the Common Fisheries Policy (*O.J.*, L 256, 03/08/2004, p. 17).
4. Council Decision 409/2007/EC amending Council Decision 585/2004/EC (*O.J.*, L 155, 15/06/2007, p. 68).
5. Communication COM(2008) 364 final, 17/06/2008.
6. *http://ec.europa.eu/maritimeaffairs/pdf/ActionPaper/action_plan_en.pdf*.
7. *http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0540:FIN:EN:DOC*.
8. *http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0540:FIN:EN:DOC*.
9. *http://ec.europa.eu/environment/iczm/ourcoast.htm*.
10. COM(2009) 538 final of 14/10/2009 and SEC(2009) 1341.
11. Maritime Safety, within the scope of relevant IMO conventions, in particular the SOLAS, STCW and COLREG conventions and related EU legislation.
12. Maritime Security, within the scope of SOLAS Chapter XI-2, Regulation 725/2004 and Directive 2005/65/EC. According to Article 2 of Regulation 725/2004: "maritime security" means the

combination of preventive measures intended to protect shipping and port facilities against threats of intentional unlawful acts.

13. MARPOL 73/78 Convention and related EU legislation.
14. With focus on control of goods.
15. With focus on the prevention of illegal immigration and cross-border crime at EU external borders.
16. With focus on the prevention of any criminal/illegal activity and on police administrative activities in the EU maritime domain.
17. COM(2008) 763 final of 20/11/2008.
18. COM(2009) 248 final and SEC(2009) 712 of 10/06/2009.
19. "Towards an Integrated Maritime Policy for Better Governance in the Mediterranean", COM(2009) 466 final of 11/09/2009.
20. Council Regulation (EC) No. 40/2008 of 16 January 2008 fixing for 2008 the fishing opportunities and associated conditions for certain fish stocks and groups of fish stocks, applicable in Community waters and, for Community vessels, in waters where catch limitations are required.
21. Council Regulation (EC) No. 1404/2007 of 26 November 2007 fixing the fishing opportunities and associated conditions for certain fish stocks and groups of fish stocks applicable in the Baltic Sea for 2008.
22. Council Regulation (EC) No. 1579/2007 of 20 December 2007 fixing the fishing opportunities and the conditions relating thereto for certain fish stocks and groups of fish stocks applicable in the Black Sea for 2008.
23. Council Regulation (EC) No. 1139/2008 of 10 November 2008 fixing the fishing opportunities and the conditions relating thereto for certain fish stocks applicable in the Black Sea for 2009.
24. Council Regulation (EC) No. 2347/2002 establishing specific access requirement and associated conditions applicable to fishing for deep sea stocks.
25. Essentially, waters situated west of longitude 4° W.
26. *http://ec.europa.eu/fisheries/fleet/index.cfm*.
27. COM(2009) 162 final.
28. Commission Regulation (EC) No. 710/2009 of 5 August 2009 amending Regulation (EC) No. 889/2008 laying down detailed rules for the implementation of Council Regulation (EC) No. 834/2007.
29. Council Regulation amending Regulation (EC) No. 708/2007 concerning the use of alien and locally absent species in aquaculture.

ANNEX 8.A1

Allocation and catches of the European Union

Species names	TAC	Allocation EU	Catch EU	% catch EU
Albacore	65 415	44 983	17 873	40
Alfonsinos nei		328	322	98
European anchovy	8 000	8 000	5 571	70
Anglerfishes nei	54 455	61 127	46 755	76
American angler			0	
Greater argentine		6 758	4 043	60
Bigeye tuna	90 000	31 500	8 238	26
Northern bluefin tuna	29 500	16 780	22 513	134
Blue ling and ling		3 065	2 643	86
Blue ling		2 628	2 396	91
Black scabbardfish		11 351	9 263	82
Atlantic blue marlin		103	26	25
Atlantic wolffish			0	
Capelin	0	28 490	0	0
Wolffishes (= catfishes) nei			71	
Cod and haddock		500	433	87
Atlantic cod	876 930	130 961	137 133	105
Common dab/flounder	17 100	17 100	12 890	75
Picked dogfish	3 669	3 619	1 956	54
Deep sea sharks		2 637	1 745	66
Flatfishes nei		300	89	30
Greater forkbeard		2 410	1 875	78
Greenland halibut	11 856	16 146	15 116	94
Haddock	81 335	78 152	58 153	74
Atlantic halibut		1 200	65	5
Atlantic herring	2 321 210	895 713	689 071	77
European hake	58 808	70 817	37 775	53
Red hake			158	
Silver hake			0	
White hake	8 500	5 000	160	3
Industrial fish		800	422	53
Jack and horse mackerels nei	240 487	250 765	183 455	73
Ling, tusk and blue ling			0	
Megrims nei	26 224	28 618	14 959	52
Ling		16 338	8 148	50
Lemon sole/witch flounder	6 175	6 175	3 716	60
Atlantic mackerel	874 713	409 540	354 580	87
Norway lobster	81 240	90 214	67 468	75
Norway pout		5 000	87	2
Orange roughy		314	372	119

Species names	TAC	Allocation EU	Catch EU	% catch EU
Other species		8 210	4 928	60
Tanner crabs nei		500	0	0
Penaeus shrimps nei	4 108	4 108	2 362	58
Amer. Plaice (= long rough dab)	0	0	949	0
European plaice	69 895	73 545	66 513	90
Saithe (= pollock)	139 827	84 708	57 629	68
Pollack	17 980	17 980	5 914	33
Northern prawn	37 604	24 661	21 342	87
Atlantic redfishes nei	73 503	47 662	20 744	44
Rat tails, mora mora, greater fork beard, roundnose grenadier			0	
Roughhead grenadier			605	
Roundnose grenadier		12 000	7 812	65
Atlantic salmon		444 116	152 540	34
Sandeels (= sandlances) nei	0	178 238	179 344	101
Blackspot (= red) seabream		2 515	1 619	64
Raja rays nei			152	
Common sole	30 072	32 804	25 029	76
Soles nei	1 216	1 216	493	41
European sprat	233 144	655 764	458 193	70
Northern shortfin squid	34 000		0	
Rays, stingrays, mantas nei	15 690	10 690	6 700	63
Swordfish	31 000	13 598	11 996	88
Turbot/brill	5 263	5 263	4 576	87
Tusk (= cusk)		1 009	650	64
Fishes unsorted, unidentified			44	
Blue whiting (= poutassou)	8 500 000	627 778	320 975	51
Whiting	50 884	50 861	32 226	63
Atlantic white marlin		47	4	9
Witch flounder	0	0	280	0
Whiting, Pollack		190	42	22
By catches (virtual) (Regulation 1691/2004)		2 480	3	0
Yellowtail flounder	15 500	0	666	0

Source: European Commission.

PART III

Chapter 9

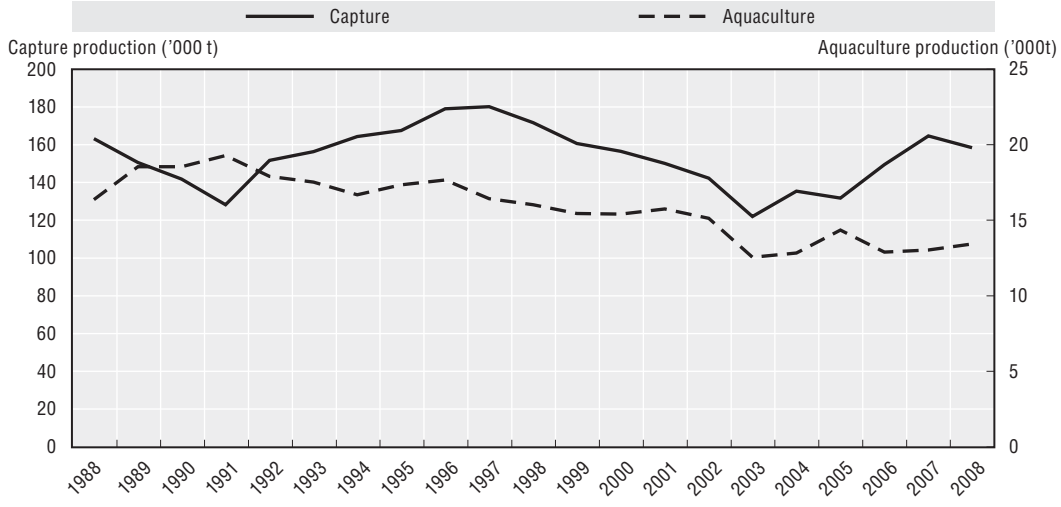
Finland

Finland

Summary of recent developments

- The total commercial marine catch was 118 000 tonnes in 2007 with a value of EUR 25.2 million. This level has been stable. The catch was 112 000 tonnes in 2008 (value of EUR 23.1 million) and 118 000 tonnes in 2009 with a value in 2009 of EUR 23.8 million.
- Aquaculture production was 13 600 tonnes (value of EUR 44.4 million) in 2009, which was 200 tonnes more than in 2008 (value of EUR 42.1 million). The total production was 13 000 tonnes in 2007 (value of EUR 42.6 million).
- National government appropriation for different subsidy measures was EUR 14.3 million in 2009 and EUR 16.6 million in 2008. The total appropriation including the share of Community's co-financing (EFF) was EUR 19.1 million in 2009 and EUR 23.9 million in 2008.
- The total gross tonnage capacity (GT) of Finnish fishing vessels has slightly increased since 2007 despite the decommissioning scheme of 2009. The GT capacity increased by 0.3% in 2008 (16 166 GT) and 1.6 % in 2009 (16 374 GT) compared to the capacity level of 2007 (16 113 GT).

Harvesting and aquaculture production (tonnes)

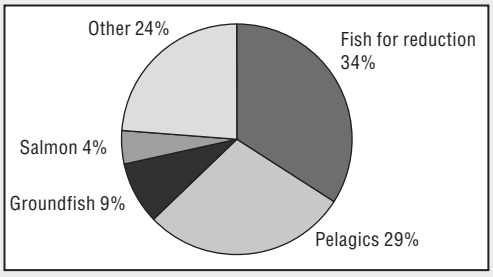


Source: FAO FishStat Database.

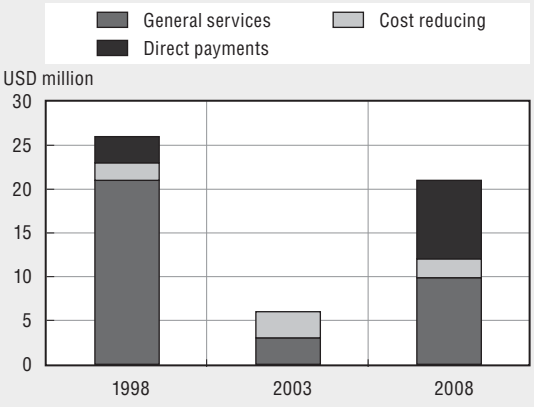
Key characteristics of the sector

- The total value of the Finnish fisheries production in 2008 was EUR 22.2 million, among which fish for reduction was the largest (34%) in terms of value, followed by pelagic (29%), groundfish (9%), and salmon (4%).
- The total amount of financial support from the government, including national schemes and co-financing, was about EUR 23.9 million in 2008 and about EUR 19.1 million in 2009 (EUR 21.4 million in 2007).
- Both import and export in fisheries have increased significantly in recent years. The total import value in 2008 was USD 45 million, which is a 267% increase in value compared to 2003 (USD 12 million). The total export value in 2008 was USD 337 million, a 93% increase in value compared to 2003 (USD 175 million).
- Three separate decommissioning schemes (vessel scrapping with community aid) of the Finnish fleet were carried out during the periods of 1997-99 and 2004-06, and in 2009. The total capacity reduction with public aid during the years 1997-99 was 827 GT. The equivalent reduction during the years 2004-06 was 1 430 GT. In 2009, 245 GT was withdrawn with public aid. The total tonnage of the fleet declined by 22.2% between 2000 and 2008.

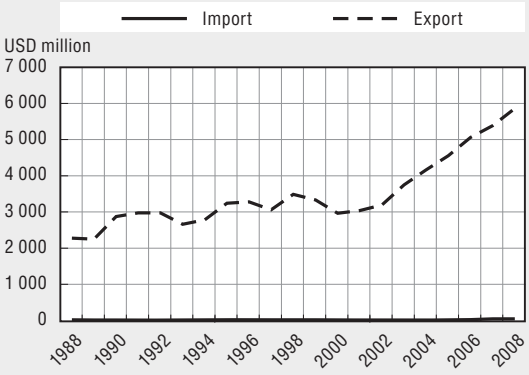
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD million)



Capacity

	2000	2008	% change
Number of fishers	3 113	2 727	–12.4
Number of fish farmers	2 000	. .[1]	. .[1]
Total number of vessels	3 663	3 242	–11.5
Total tonnage of fleets	20 782	16 165.7	–22.2

1. 2008 data not available.

Legal and institutional framework

Resource management, national measures

The resource management in Finland is harmonised according to the EU Common Fisheries Policy. In addition to that Finland implements the Community legislation concerning Common Marketing Policy, Financial Support Policy, Fishing Fleet Policy and Common Control Policy.

The Finnish fishing fleet register contains all the vessels engaged in commercial maritime fisheries and aquaculture. The fleet register is part of the Community fishing vessel register.

The catch register and first buyer register are also maintained in accordance to the appropriate control system applicable to the EU Common Fisheries Policy.

Capture fisheries

Production

The total marine commercial catch was 117 541 tonnes with the value of EUR 23.8 million in 2009. In 2008, the catch was 112 000 tonnes and the value of this was EUR 23.1 million. The most important species is Baltic herring (*Clupea harengus membras*), which constitutes about 77% of the catch volume. The volume of sprat (*Sprattus sprattus*) was 20%.

The commercial inland fisheries catch in 2009 was 3 912 tonnes with the value of EUR 6 million. Vendace (*Coregonus albula*) is economically the most important inland species (2009: catch 2 496 tonnes and value EUR 4.4 million).

Fleet

The Finnish fishing vessel register is managed in accordance with the Common Fisheries Policy and Fishing Fleet Policy rules, Council Regulation (EC) No. 2371/2002 and Community Fleet Register, Commission Regulation (EC) No. 26/2004. Registered fishing fleet capacity at the end of 2009 consisted of 3 271 vessels (2008: 3 242 vessels). There were 16 bigger pelagic trawlers (over 24 metres) engaged in Baltic herring and sprat fisheries (2008: also 16 vessels) but only 1 bottom trawler in cod fishery (2008: also 1 vessel). The number of smaller (12 to 24 metres) vessels was 87 (2008: 100 vessels). The rest of the units (small coastal vessels under 12 metres), 3 168 in 2009 and 3 126 in 2008, were used in small-scale coastal fishery (mainly for salmon and brackish water non quota species).

Recreational fisheries

The number of people engaged in recreational fishing has been stable in recent years. The accurate figure for 2008 was 1.779 million persons. There were 1.450 million inland fishers and 0.350 million maritime fishers. In 2006, the total figure was 1.951 million. The total recreational catch in 2008 was 32 865 tonnes (41 987 tonnes in 2006). In 2008, the inland catch was 25 100 tonnes and maritime catch was 7.765 tonnes. Recreational catches by definition are not marketed.

Aquaculture

Production

Aquaculture production for human consumption consists mainly of large-size rainbow trout. Its production, including roe, was about 12 738 tonnes in 2009 and

12 639 tonnes in 2008. The production value (VAT not included) was EUR 37.9[1] million in 2009 and EUR 36.8[2] million in 2008. For other fish species, the corresponding figures were 889 tonnes and EUR 6.5 million in 2009 and 801 tonnes and EUR 5.3 million in 2008. Of this, as much as 848 tonnes and EUR 6.3 million (726 tonnes and EUR 4.9 million in 2008) was powan (*Coregonus lavaretus*) production.

Production facilities

The total number of employed people (including owners) on fish farms was 491 persons in 2007 (494 persons in 2006). In 2009, there were 141 sea farm units and 374 inland farm units, totalling 515 units. Of this, 187 units were engaged in fish production for human consumption. Food production facilities are mostly marine net cages which are commonly situated in the coastal archipelago area. The rest of the farms produce juveniles for stocking and breeding purposes either on farms (103 units in 2009) or in natural food ponds (227 units in 2009).

Government financial transfers

National financial support

New fishing loans from private banks for fishing vessels, gear and equipment supported by the government interest rebate scheme have not been granted since 1995. The rate of interest of old loans is as low as 2.5% according to the reference rate of the Finnish Bank. Due to this, the interests of old loans were not subsidised during the years 2007-09.

As before, the fisheries insurance scheme was maintained by six fisheries insurance associations plus one private insurance company in Aland County. The main part of indemnification comes from the government. Only commercial fishermen are entitled to insure their vessels, gear and equipment under this scheme, which applies to the Baltic Sea region. The government subsidy was EUR 0.93 million in 2007 and EUR 1.16 million in 2008 and respectively EUR 1.05 million in 2009.

The insurance scheme will be harmonised according to the European Commission's general outlines of state aid in the very near future. This scheme was under scrutiny of the European Commission. The aim was to determine whether the scheme is in harmony with the Financial Support Policy in the Community.

The fuel tax exemption for professional fishermen amounted to EUR 0.30 million in 2007, EUR 0.31 million in 2008, and EUR 0.26 million in 2009.

Co-financing under EFF

According to Community Financial Support Policy in the fisheries sector in the European Union, the sector is granted economic assistance. Starting from 1 January 2007 a new structural programme (2007-13), European Fisheries Fund (EFF), was opened for this purpose.

Structural assistance may be granted for permanent withdrawal and transfer of vessels, modernisation of vessels, development of aquatic resources, aquaculture, fishing port facilities, processing and marketing, inland water and winter fishery, small scale coastal fishery, social-economic measures, sales promotion, operations by members of the trade and technical support.

The commitments of fisheries assistance in the structural programmes (EFF) in Finland amounted to EUR 17.8 million in 2007. The national share for that was

EUR 11.7 million leaving the share of the Community to EUR 6.1 million. In 2008, the figures were: total EUR 20 million, the national share EUR 12.8 million and the Community share EUR 7.2 million. The structural assistance according to the EFF programme for 2009 totalled to EUR 15.4 million. The national share was EUR 10.7 million and the Community share was EUR 4.7 million, respectively.

Total financial support

The total amount of financial support from the government, including national schemes and co-financing, was about EUR 23.9 million in 2008 and about EUR 19.1 million in 2009 (EUR 21.4 million in 2007). The national share of these figures was EUR 16.6 million in 2008 and EUR 14.3 million in 2009 (EUR 15.3 million in 2007).

Structural adjustment of the fishing fleet

Finland implemented the extended fourth Multi-Annual Guidance Programme of fishing fleets of Community during the years 1997-2002 (MAGP IV). Finland managed to fulfil the requirements of the MAGP well before the end of 2002. The Community fleet management system was renewed from 1 January 2003 and the special capacity reference levels for the fleets of Community member states were launched. The level constitutes basically of the sum of the fleet segments. The Finnish reference levels for the fishing fleet are 23 203 GT and 216 195 kW.

Three separate decommissioning schemes (vessel scrapping with community aid) of the Finnish fleet were carried out during the periods of 1997-99 and 2004-06, and again in 2009. The total capacity reduction with public aid during the years 1997-99 was 827 GT and 4 158 kW. The equivalent reduction during the years 2004-06 was 1 430 GT and 6 116 kW. In 2009, the capacity of 245 GT and 1 698 kW was withdrawn with public aid.

Market and trade

The competition between farmed rainbow trout and imported farmed salmon and rainbow trout mainly from Norway continued to be strong, but was slightly eased due to protection measures taken by the Community and due to production problems in Chile. The import price has been low for many years (in 2002, as low as EUR 2.25/kg), causing problems in the profitability of the domestic production of farmed rainbow trout. The import price has risen considerably in recent years. In 2009, it was fairly reasonable at EUR 4.41/kg.

As an EU Member State, Finland applies the common custom policy concerning tariffs, tariff quotas, import quotas, and licensing of the Community.

Outlook

Baltic herring is the most important and significant species in Finnish marine professional fisheries, not only for human consumption but also for industrial purposes. The latter is generally forbidden in the European Union, but in the Baltic Sea this fishery may be conducted according to Council Regulation (EC) No. 2187/2005 which imposes technical conservation measures in the Baltic Sea.

The European Union has adopted the Council Regulation (EC) No. 2187/2005 and prohibited the use of driftnets in the Baltic Sea after a transitional period from the beginning of 1 January 2008. The year 2005 was the first regulated transitional year.

Seals in the Baltic Sea cause from year-to-year increasing losses to salmon and powan catches, and thus to fishermen. As of 2008, Finland has implemented a special public aid scheme to compensate for part of these losses. This scheme was approved by the European Commission.

The Finnish Producer Organisation (PO) for Baltic herring (capture fisheries) was closed several years ago, leaving Finland without any POs.

Consumers in Finland are offered an increasing varied range of fish species. This has been possible due to the growth of imported species of fish.

Notes

1. The value of roe is included.
2. The value of roe is included.

PART III

Chapter 10

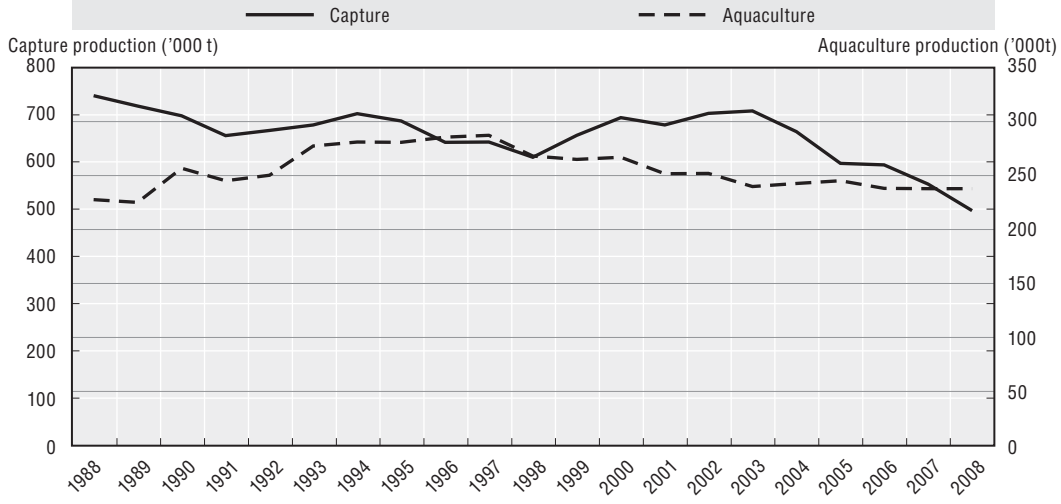
France

France

Summary of recent developments

- At the institutional level, it is worth noting the re-organisation of local government, within the more general framework of a vast overhaul of the State, as well as the merger of several agriculture and fisheries departments into a single body.
- On the legislative front, 2010 saw adoption of the Modernisation of Agriculture and Fisheries Act, following the completion of a procedure launched in 2009; this legislation provides for an in-depth reform of the management of the fisheries and agriculture sector, while laying the groundwork for prospective changes in European policies. The procedures for consultation and negotiation prior to the adoption of public policies have also been significantly amended.
- Elsewhere, France has pursued its efforts to adjust its fleet and also to ensure the sustainable development of fisheries resources, notably through its management and restructuring plans. A number of initiatives have also been undertaken, or are being pursued, in support of sustainable development.
- Lastly, it should also be noted that since 2008, the French oyster sector has found itself facing an exceptionally severe crisis resulting in massive deaths of young oysters (spat) in particular, which has required action to be taken by the government. French oyster production accounts for around 90% of European production.

Harvesting and aquaculture production (tonnes)

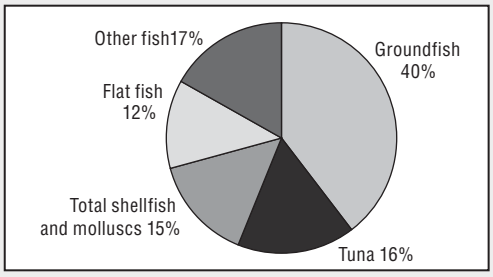


Source: FAO FishStat Database.

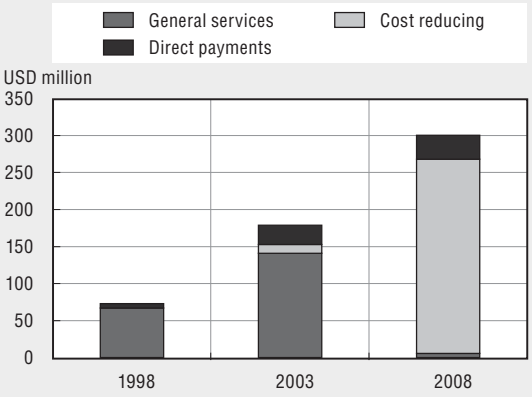
Key characteristics of the sector

- In 2008, 499 000 tonnes of fish, shellfish, molluscs and seaweed were landed by French vessels, including landings into overseas *départements* (DOM) (444 000 tonnes in 2009).
- The turnover generated by French sea fisheries amounted to EUR 970 million in 2008 compared to EUR 930 million in 2009. Over the past two years, sales in metropolitan France have fallen substantially, amounting to a 9% decline in constant Euros.
- Imports are high and amounted to 2 181 million tonnes in 2009 in equivalent live weight. 54% of imports, which cost EUR 4 040 million in 2009, were from European countries (including Norway, Switzerland and Ireland) and 46% from the rest of the world.
- French exports of aquatic products for human consumption amounted to 614 000 tonnes in equivalent live weight which were worth EUR 1 185 billion in 2009.
- Most government financial transfers were made through the European Fisheries Fund (EFF) and the instruments used by EU regulations to regulate the market. National expenditure, which was strictly controlled, primarily related to research, fisheries inspection and, exceptionally, the payment of compensation to the victims of natural disasters.
- From the early 2000s until 2010, France introduced over twenty programmes to reduce its fishing capacity, notably through plans for assisted fleet withdrawals. These efforts will continue in 2011. However, the results as of 31 December 2010 are already highly positive in that these capacity adjustment plans have already allowed over 800 vessels to be removed from the fleet, *i.e.* almost 45 000 UMS and 180 000 kW.

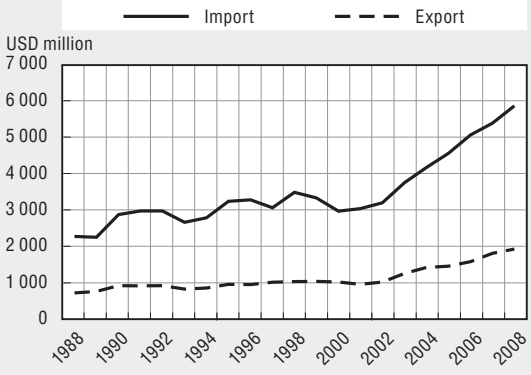
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	260 016	19 624	–24.6
Number of fish farmers	n.a.	19 995	n.a.
Total number of vessels	8 181	n.a.	n.a.
Total tonnage of fleets	230 172	n.a.	n.a.

1. Includes fish farmers and processing.

Legal and institutional framework

Competent public authorities and legal bases

European framework: Common Fisheries Policy

In Community waters, France, as an EU Member State, implements the Common Fisheries Policy (CFP), which was reformed in 2002 by virtue of Regulation (EC) No. 2371/2002 of 20 December 2002 (see Chapter 8 on the European Union).

National framework

There were some major changes in the legal and institutional framework for sea fisheries and aquaculture in France in 2009 and 2010, which are presented below.

Legal basis

Until 2010, French fishing policy, whether it be in terms of resource management, the status of fishermen and fishing businesses, the organisation of the sector, and the marketing and sale of sea fishery products, was legally governed by the Legislative Decree of 9 January 1852, as amended in particular by the Outline Act of 18 November 1997 on Sea Fisheries and Marine Farming. In particular, it underlined the key role played by the State in the distribution of fishing licences and catch quotas.

The need to modernise the agriculture and fishing sectors became apparent at the end of 2009 in order to tackle the crises in these sectors and also to prepare for forthcoming changes in European polices, at the level of both the Common Agricultural Policy (CAP) and the Common Fisheries Policy (CFP). It is for this reason that the Minister in charge of agriculture and fisheries decided to draw up draft legislation on the modernisation of agriculture and fisheries by as early as September 2009, at the same time as the Fishing Conclave was taking place (see below). Act No. 2010-874 on the modernisation of agriculture and fisheries (LMAP) was enacted on 27 July 2010.

Section VII of the LMAP provided for measures aimed in particular at modernising the governance of fisheries and aquaculture along the following major lines:

- creation of advisory bodies and provision for public participation (creation of a Scientific and Technical Liaison Committee – see below);
- planning of coastal areas (creation of marine seaboard committees and regional aquaculture development plans, plan to combat marine pollution from kepone;
- establishment of procedures for initial sales of landed sea fishery products;
- clarification of the responsibilities and powers for regulating and managing fishery resources (between central government, fishery committees and Producer Organisations), see below;
- reform of the industrial organisation of sea fisheries and fish farms and the organisation of the shellfish farming industry, see below;
- procedures for the breakdown of taxes on offshore wind farms.

Governance

Public powers

In France, responsibility for administering the sea fishing and aquaculture industry lies with the Directorate for Sea Fisheries and Aquaculture (DPMA), part of the Ministry of Agriculture and Fisheries (MAP). This Directorate is tasked with determining policy directions for the sector and implements the relevant regulations and measures.

With regard to the implementation of public policies towards sea fisheries and aquaculture, the DMPA works through a network of decentralised government departments located throughout the national territory and placed under the authority of the Prefects. The organisation of these departments underwent significant changes between 2009 and 2010 as part of the General Review of Public Policies (RGPP) conducted by the French government.

Support for branches

Furthermore, the governance of the sea fisheries and aquaculture has also undergone major changes. On 1 April 2009, the National interbranch agency for sea fishery and aquaculture products (OFIMER) became FranceAgriMer, through the merger of five agricultural agencies (Ofimer, *Office de l'élevage*, ONIGC, ONIPPAM and Viniflhor).

Industry bodies

The participation of all actors in the branch and their involvement in the management of the resource is currently ensured in particular by the National Committee for Marine Fisheries and Marine Fish Farms (CNPMEM). It is mandatory for the CNPMEM to be consulted on any domestic or Community measure regarding fisheries conservation or management, the conditions applicable to commercial fishing or the working of the industry as a whole. The Committee can, like the regional committees, issue licences endorsed by the government for certain fisheries. The regional and local* sea fishery committees, for their part, provide the industry with technical assistance and information and are actively involved in drawing up measures taken at the national level regarding regional committees (issuing of licences) and social initiatives.

This organisation has recently been reviewed in depth with the enactment of the LMAP (see above), with the aim of streamlining the professional organisation of marine fisheries and marine fish farm, to adjust structures to changes in resources and to ensure greater consistency between the decisions they make – in particular local committees have been replaced by *département* or *inter-département* committees.

Advisory bodies and public participation/transparency

The LMAP provides for the creation of advisory bodies in the fisheries sector to organise public participation in the preparation of government decisions that have a direct and significant impact on the environment:

- The LMAP provides for the creation of a **Scientific and Technical Liaison Committee for Sea Fisheries and Aquaculture:** The purpose of this scientific and technical liaison committee is to promote dialogue between scientific experts, professionals, society and government in order to conduct a joint analysis of the state of the resource and initiate forward-looking discussions on changes to fishing policy, aquaculture policy and professional practices.
- **Public participation/transparency:** The LMAP sets out a procedure designed to consult and secure the participation of the public in government decisions that have a direct and significant impact on the environment.

* Under the provisions of the LMAP, however, local committees are due to be replaced by departmental or interdepartmental committees (see below).

Furthermore, it should be noted that a process of consultations and discussions known as the "Fishing Conclave" was organised in the last quarter of 2009, which brought together all the actors concerned in order to identify lines of convergence and establish France's stance towards the forthcoming reform of the CFP.

Lastly, and more generally, it is worth mentioning the organisation of a Grenelle Environment Forum on the Sea, a vast multi-party process of discussions and negotiations launched in 2009 with the aim of setting out a national strategy towards the sea and coastal regions. The outcome of the Grenelle Environment Forum was a series of 137 commitments in respect of the sea and the coastal regions, based on the following major policy directions announced by the present President of the Republic in his speech on French maritime policy given on 16 July 2009 in Le Havre: "*protect the natural resources of the sea in order to make better use of them in a sustainable manner; develop an industrial policy that incorporates marine professions; and step up government action regarding the sea*" (notably with regard to pollution and illegal fishing).

It should also be noted that among the proposals and commitments to emerge from the Environment Forum was a decision to proceed with the introduction of an ecolabel at the national level.

Capture fisheries

Performance

France accounted for around 9.7% of EU catches in 2008 and 8.6% of catches in 2009, the fourth highest ranking EU Member State. The French fleet takes almost three quarters of its catches in the North-East Atlantic, whose waters border the coasts of Europe. 22% of catches are made in the tropical waters of the Atlantic and the Indian Ocean (primarily tuna fishing), and 4.7% in the Mediterranean.

In 2008, French vessels landed 499 thousand tonnes of fish, shellfish, molluscs and seaweed, including landings into overseas *départements* (444 thousand tonnes in 2009). The largest tonnages landed included: tuna (101 000 tonnes, in particular yellowfin and skipjack), sardines (32 700 tonnes), herring (19 700 tonnes), anglerfish (18 000 tonnes), saithe and mackerel.

Landings of fresh fish into metropolitan France amounted to 291 500 tonnes, *i.e.* over two-thirds or total catches. Frozen and processed fish landings are constantly declining, primarily due to the decline in tuna catches.

The turnover generated by French sea fishing amounted to EUR 970 million in 2008, compared to EUR 930 million in 2009. Over the past two years, metropolitan sales have fallen substantially by 9% in constant Euros. The main commercial species by value remain: tuna, anglerfish, sole, scallop, hake and Nephrops. 60% of metropolitan sales took place at French fish auctions and one quarter abroad. Brittany accounted for one-third of sales.

Status of fish stocks

EU stocks

One of the main actors involved in assessing fish stocks in the North-East Atlantic is the International Council for the Exploration of the Sea (ICES). The evaluations requested by the European Union of fish stocks harvested by its fleet allow adjustment of the various measures introduced by the EU when they indicate overfishing likely to jeopardise the long-term sustainability of the species concerned.

It is not possible to discuss here the full contents of the scientific opinions available on resources of interest to France. Up to 2010, recommendations were aimed at maintaining (or re-building) stocks within safe limits. Scientific opinions are now based on the objective of ensuring maximum sustainable yield (MSY).

Opinions regarding stocks for which a quantitative analysis and/or simulations are not available are based on trends in stock levels (qualitative approach).

Other stocks

Stocks of interest to other regions and of sufficient size to be addressed at the international level are monitored by the Scientific Committees of the Regional Fish Management Organisations (RFMO) that have jurisdiction.

Lastly, some stocks are monitored at the national level. These are coastal stocks in metropolitan France, which are mainly monitored by IFREMER (large shellfish, for example, or scallops), or stocks found in the waters of overseas *départements* or territories that are not subject to the CFP such as Antarctic toothfish in the waters of the Kerguelen and Crozet islands which are monitored by the French National History Museum.

Management of commercial fishing

Management instruments

French-flagged vessels are only permitted to fish against national quotas and are only issued a fishing licence if a genuine economic link exists with the territory of the French Republic and if it is managed and monitored from a stable establishment on French soil.

Management of species subject to EU quotas

Every year the French authorities divide up and allocate to Producer Organisations (POs) and vessels that are not members of a PO a number of fishing quotas assigned to France by the European Union. This management of French fishing quotas is based on the principle of a fair distribution between different Producer Organisations; sub-quotas are established by taking account of fishing precedents as well as market trends and socio-economic balances, in accordance with the provisions of the rural and marine fishing code (amended Legislative Decree of 9 January 1852 that has largely been repealed, see above).

The quotas allocated to France in 2008 amounted to 287 308 tonnes. However, through transfers with other Member States, France was able to increase its fishing opportunities to 300 634 tonnes (the quotas used most being those for stocks of sole, mackerel, cod, anglerfish, black scabbardfish, Nephrops and blue-fin tuna).

Reduction in fishing capacities

Between the early 2000s and 2010, France introduced over twenty programmes to reduce its fishing capacity, notably in the form of vessel decommissioning assistance plans. These efforts will be pursued in 2011. However, the results as of 31 December 2010 would already seem to have been highly positive in that these capacity adjustment plans have already secured the decommissioning of over 800 vessels, i.*e.* almost 45 000 UMS and 180 000 kW.

Moreover, it should be noted that most capacity reduction programmes implemented by France related to what are considered to be “sensitive” fisheries where it was felt necessary to adjust (reduce) the size of the working fleet.

Table 10.1. **Fishing capacity and vessel decommissioning plans**

Year of vessel decommissioning	Rated power (kW) removed from fleet through assistance (rounded up)	Gross tonnage (UMS) removed from fleet through assistance (rounded up)	Number of vessels whose with withdrawal from the fleet was assisted
2000-2001	19 843	2 418	157
2003-2004	43 930	13 027	193
2006	23 226	6 163	85
2007	39 010	9 719	164
2008	1 847	461	6
2009	48 073	12 692	220
2010	84	11	2
General total	**176 013**	**44 490**	**827**

As of 31 December 2009, the metropolitan fleet consisted of 4 857 vessels. The breakdown of the fleet was maintained with most of the fleet falling into the under 12 metre segment (3 796 vessels) and a small proportion of the fleet consisting of vessels of 25 metres and above (226 vessels).

The inshore fishing fleet, three quarters of whose activity is within the 12-mile zone, occupies 70% of vessels but generates only 30% in terms of value. Deep-sea fishing, 75% of which takes place outside the 12-mile zone, occupies 15% of vessels but generates 50% in terms of value. Lastly, mixed fishing, encompassing both types of activity, occupies 13% of vessels and generates 20% in terms of value. In terms of sales at auction, inshore fishing (one to four days at sea), open-sea fishing (over four days at sea) and small scale fishing (less than one day at sea) each account for around a third of landings.

System for the management of fishing effort

An EU system for managing the fishing effort, expressed in kilowatt days, has been in force since 1995 for groundfish, deep-sea species and certain shellfish and crustaceans. This system is designed to cap the annual overall fishing effort of fleets harvesting these species. It was amended in 2002 with regard to deep-sea species and in November 2003 with regard to groundfish, scallops and certain crustaceans.

In addition, the reform of the CFP, adopted in December 2002, enshrined the principle of management plans and stock recovery plans. For stocks considered to be outside their safe biological limits, it is planned to introduce recovery plans which will be replaced by long-term management plans once the biomass has been rebuilt to a precautionary level.

While the situation regarding a number of fish stocks and the economic health of the sector does indeed give cause for concern, progress has nonetheless been seen in a number of resources, as shown by an assessment carried out by French scientific establishments.

Species not subject to EU quotas

Certain stocks of fish species that are not subject to EU management measures require specific regulations at the national or regional level. The Minister in charge of marine fishing and the professional organisations are competent to establish general rules – introduction of licences, for example – whose management they can entrust to regional bodies.

Shore fishing

Decree No. 2001-426 of 11 May 2001 regarding professional shore fishing creates a special status for shore anglers, of which there are around a thousand in France. The

recognition of this profession in 2001 allowed it to be incorporated into the professional organisation of marine fisheries (CNPMEM). In accordance with the provisions of the Decree of 11 May 2001, shore fishermen must be in possession of a special licence to fish and to sell their catches, a licence issued by the government (through the Prefect of the *département*).

The reform of this Decree was a long drawn-out process which was completed with the publication of Decree No. 2010-1653 of 28 December 2010 amending the initial Decree. The main innovations introduced by the new Decree are primarily as follows: creation of a national licence, in order to simplify its administrative management and to permit creation of a national database, although licences will be issued at the local level (by the Prefect of the département); and introduction of a requirement for new entrants to undergo a training course.

Particular case of the Mediterranean

Mediterranean fisheries are distinctive in terms of: the geography of this semi-enclosed sea with a narrow continental shelf; the diversity and density of users of marine resources; the species targeted; and the absence of any TAC or quota system (the one exception being blue-fin tuna). In this particular context, France has developed its own resource management system governed by Decree 90-95 of 25 January 1990, which lays down the general requirements for Mediterranean Sea fisheries.

Particular case of the TAAF

The French Southern and Antarctic Territories (FSAT) are not covered by the EU Common Fisheries Policy. Act No. 2007-224 of 21 February 2007 (Art. 14) setting out statutory and institutional provisions regarding French Overseas Territories amended Act No. 55-1052 of 6 August 1955 which gave full administrative and financial autonomy to French Southern and Antarctic Territories, in particular by changing its title in order to include the islands of Bassas da India, Europa, Glorieuses, Juan de Nova and Tromelin in the definition of FSATs.

Three fisheries are fully managed by the FSATs, further to the publication in 2009 of Decree No. 2009-1039 of 26 August 2009 regarding the conditions applicable to marine fishing the FSATs, in application of Act No. 66-400 of 18 June 1966 as amended on marine fishing and the harvesting of marine products in the FSATs; the latter consist of toothfish in the EEZ around Kerguelen and Crozet Islands; rock lobster in the EEZ around the islands of Saint-Paul and Amsterdam and tuna in the EEZ around the Scattered Islands in the Mozambique channel.

These texts, as well as their enabling orders, establish the rules for the management of fishery resources and in particular set out total allowable catches (TAC) and the technical requirements imposed on fishing activities. The regulatory system also includes measures adopted by France as a member of the Commission for the Conservation of Antarctic Living Marine Resources (CCAMLR).

France is extremely concerned about the illegal unregulated and unreported (IUU) fishing which still goes on the areas surrounding the FSATs and to combat this serious problem is developing policing resources in co-operation with neighbouring countries, in particular Australia (see below).

Agreements allowing access to foreign vessels

As a general rule, France does not enter into bilateral agreements on fishing since the latter fall within the jurisdiction of the European Union; however, France does retain jurisdiction over its overseas territories that are not covered by the CFP. Certain foreign vessels may therefore have access to French waters in such contexts.

Management of recreational fishing

Situation in the sector

A survey of recreational fishing in France, carried out in particular by the DPMA and IFREMER between 2006 and 2008, estimated the number of people aged 15 and over who had practised recreational fishing at sea in 2005 at 2.58 million. This population is highly heterogeneous and only a small proportion carry out fishing on a continuous and large-scale basis: 3% are underwater anglers, 13% are anglers operating from a boat during a large part of the year, and 4% are experienced anglers fishing from the shore.

The statistical extrapolation of the findings of the survey conducted by IFREMER would suggest the following estimates of annual catches that can be attributed to all marine recreational fishing: 15 000 tonnes of fish (including 5 000 tonnes of bass), 12 000 to 15 000 tonnes of shellfish, 1 500 tonnes of shellfish and 500 tonnes of cephalopods.

The amount of money spent directly on recreational fishing (travel, gear, boats, reviews, etc.) has been estimated to amount to EUR 900 million a year in metropolitan France, broken down into EUR 435 million for expenditure on gear, EUR 308 million for expenditure on boats and EUR 152 for expenditure on travel.

Regulatory framework and Charter of commitments and objectives

Recreational fishing is governed by amended Decree No. 90-618 of 11 July 1990 on the practice of recreational sea fishing. These provisions are supplemented by a Ministerial Order of 21 December 1999 setting out minimum catch sizes for marine species for recreational anglers. The sale of recreational fishing catches is strictly forbidden. French regulations on recreational fishing set out a comprehensive list of the type of gear that can be used by recreational anglers.

In the case of underwater recreational fishing, the use of breathing apparatus and night fishing are both prohibited; practitioners of snorkel fishing must notify the local authorities and, in addition, take out civil liability insurance. Special regulations are also in place local level.

A Charter of commitments and objectives for environmentally friendly recreational sea fishing, co-signed by the Ministries in charge of the sustainable development and fishing and the various actors concerned, was adopted in July 2010. The provisions of this charter generally concern the management of the resource, exchanges between the administration and recreational anglers, the fight against fraud (in particular with the identification of catches), the introduction of a declaration of the activity of recreational sea fishing; they also provide for future developments in the regulations as well as the assessment of the application and efficiency of the charter.

Fisheries inspection and policing

Responsibility for the oversight of marine fishing activities lies with the Ministry in charge of sea fisheries (DPMA), which decides what actions to take both at sea and on land. The DPLMA primarily works through maritime affairs departments and in particular the CROSS at Etel (which hosts the National Centre for fisheries surveillance) as well as the French navy, the Gendarmerie, customs and excise, the department of competition, consumption and anti-fraud, as well as veterinary departments. The actions of the departments involved in the field are co-ordinated, both at sea and on land, by regional Prefects at an inter-regional level.

French inspection policy is mainly pursued within the framework of the European Union which in 2008 and 2009 overhauled its inspection system in order to fight IUU

fishing more effectively. The main changes consist in the introduction of electronic declarations regarding catches, landings and transhipments, as well as electronic documentation requirements regarding sales. The aim of these measures is to gain a better understanding in the very short terms of the activities of the entire fishing sector, from capture to market. Furthermore, it should be recalled that the fishing partnership agreements (FPA) signed by France with the European and third countries contain a section dealing with the inspection of French vessels.

Outside the framework of the European Union, the bilateral agreement on co-operation in fisheries inspection and monitoring signed between France and Australia is the most significant action in terms of co-operation in the area of fisheries surveillance. This agreement is intended to supplement the treaty between these two countries on the surveillance of fishing activities in the maritime areas adjacent to French Southern and Antarctic Territories (FSAT), Heard Island and the McDonald Islands.

Multilateral agreements and arrangements

France, either by virtue of its overseas territories or as an EU Member State, is a contracting party to several regional fisheries management organisations (RFMOs), and within such organisations plays an active role in drawing up recommendations and conservation measures aimed at ensuring the rational harvesting of fish resources in international waters as well as in exclusive economic zones.

Aquaculture

Production capacities, production volume and value

French aquaculture activities primarily consist in shellfish farming and to a lesser extent fish farming. Seaweed farming is a growing activity, but remains very limited.

Fish farming

Fish farming in France comprises three distinct farming sectors: salmon farming, marine fish farming and pond-based fish farming. The total output from these sectors of activity amounted to 51 500 tonnes in 2008, generating a turnover of around EUR 180 million.

French firms can draw on the expertise of highly effective research bodies (INRA, IFREMER). Furthermore, this sector is highly organised around an inter-branch body, the Inter-branch Committee on aquaculture products (CIPA).

However, aquaculture in France is currently experiencing structural problems and difficulties arising from the economic climate. Salmon production and the number of fish farms in France fell by 20% between 1997 and 2007, primarily due to the constraints of stricter environmental regulations. French marine fish farms are stagnating (no new farms are being set up) after a period of sustained growth until 1995, the scope for development being limited by the scarcity of available sites and competition from other seaboard activities, notably tourism.

Shellfish farming

Farmed shellfish production in France amounted to 86 692 tonnes in 2008, of which 105 000 tonnes of oysters and 78 000 tonnes of mussels, generating a total turnover of EUR 500 million.

France is by far the largest producer of oysters in the EU (accounting for 90% of production) and ranks fourth at international level. Mussel farming is a seasonal activity

which is unable to supply the whole of the French market, requiring imports of a volume practically equivalent to that of production. Lastly, other more modest sectors help to diversify French shellfish production (2 300 tonnes of cockles and carpet clams).

There are some 3 000 shellfish farms in France, most of which are small traditional units: over 70% are one-man firms. In all, they employ 17 200 people, representing 9 200 FTE jobs. While the number of firms has fallen since 2001, the shellfish farming activity remains stable.

Shellfish farms are distributed along the entire French seaboard. The Marennes-Oléron basin alone accounts for almost 40% of all sales of oysters. Shellfish farming shapes the economies of coastal regions and, through the jobs it creates, helps to maintain the economic fabric.

In view of consumers' eating habits, almost all production is sold live, the share of processed products remaining very small. However, it is worth noting the strong trend towards consumption of imported processed products.

The industry is organised at the national level by the National Shellfish Farming Committee (CNC). The CNC oversees all professional workers in the branch and is divided into 7 Regional Shellfish Farming Committees along France's seaboard, membership of which is mandatory.

Since 2008, the oyster farming branch has been faced with an exceptionally serious crisis: massive deaths of young oysters (up to 100% in some areas) have been reported during the summer period in all production basins. This phenomenon is having a huge impact on oyster farms, which have been receiving help from the French government. A large-scale research programme is currently being conducted by IFREMER and its partners in an attempt to determine the reason behind these deaths and to identify sustainable ways of overcoming the crisis.

Seaweed farming

Seaweed farming is at present no more than a micro-branch (three known farmers) whose production amounts to around 50 tonnes of fresh seaweed, *i.e.* 0.1% of the 50 000 tonnes of fresh seaweed harvested every year in France and which are therefore almost exclusively harvested on foot or from a boat.

Recent policy changes

France has taken a number of initiatives to promote the responsible development of aquaculture.

Regional aquaculture development schemes

The LMAP adopted in 2010 also made it possible to draw up Regional Aquaculture Development Schemes (SRDA). Article 85 of the Act added a new article L. 923-1-1 to the rural and maritime fishing code, which provides for the establishment of regional aquaculture schemes in each every region bordering the sea, with the aim of drawing up a list of existing sites as well as suitable sites for the future development of sustainable marine aquaculture.

Fish farming

Strengthening the partnership with the environmental world, including, for example:

- the organisation by the French Committee of the International Union for Conservation of Nature (IUCN), with financial backing from the DPMA, of a seminar in September 2010

whose conclusions will contribute directly to the drafting of a guide to the sustainable development of the freshwater trout and salmon farming branch, currently being drawn up by the IUCN, and whose first objective is to propose recommendations for sustainable and responsible aquaculture aimed at both fish farmers and elected officials;

- the introduction of a governance framework to provide a more structured setting for dialogue between representatives of the fish farming branch and the departments tasked with designing and implementing policies relating to surface waters (Ministry in charge of the environment and the National Agency for Water and Aquatic Environments [ONEMA]); these efforts should lead to the signature, by the end of 2010, of a charter of commitment to the sustainable development of French aquaculture.

Funding of research into wastewater treatment and improved feed (future substitutions aimed at reducing the share of animal protein in fish food: use of micro-seaweeds):

- Pursuit of the PROPRE project (*PROduction piscicole responsable et durable dans un environnement PREservé* – Responsible and sustainable fish farming in a preserved environment) launched in 2009 relating to the creation of production systems that are compatible with the Framework Directive on Water (DCE) and the objectives relating to the good or very good ecological condition of waterways or coastal areas; this project must pave the way for development of a diagnostic tool for fish farms and propose to them technical and economically validated systems for treating wastewater.

Financing of public communication campaigns, notably within the framework of the EFF, run by the Inter-branch Committee for Aquaculture Products (CIPA), for example:

- Launch in autumn 2009 of the "Aquaculture in our regions" quality charter; "No more stereotypes" communication campaign, etc.

Shellfish farming

Against a background of massive deaths in the Pacific Oyster population, the Minister in charge of agriculture and fisheries sought to organise a wide-ranging debate on all the substantive issues regarding shellfish farming. Besides the mass deaths crisis, the shellfish farming sector is facing numerous challenges which can hold back its development: competition with other activities for access to and use of the shoreline, dependency of the sector on the quality of water and the environment, complexity of research topics, insufficient technical support at national level, etc.

It is worth noting that the LMAP confers new powers on the CNC and provides for the creation of a shellfish farm register in the CRCs and a list of applicants for creation of a shellfish farm.

Fisheries and the environment

Changes in environmental policy

From a general standpoint, let us recall the organisation in 2009 of a Grenelle Environment Forum on the Sea, a vast consultative and decision-making process aimed at supplementing the Grenelle Environment Forum, which was itself launched in 2007 and which led to the adoption of major legislative measures between 2008 and 2010.

Responsibility for the design and implementation of environmental policies in France lies with the Ministry in charge of the environment and sustainable development. However, the issue of environmental protection and sustainable development is increasingly liked to all decisions taken with regard to fisheries and aquaculture management.

Responses to exogenous environmental threats to aquatic ecosystems

In terms of fisheries management, France has introduced several management plans targeting a given species or geographical sector (eel management plan, Mediterranean management plan, etc.: see above).

With regard to the conservation of Atlantic salmon stocks, France (National Agency for Water and Aquatic Environments) has drawn up a French salmon conservation plan, under the mandate of the Ministry in charge of the environment and sustainable development and in application of measures set out by the North Atlantic Salmon Conservation Organisation (NASCO). This plan, validated by NASCO in June 2008, takes stock of the status of salmon stocks – abundance, diversity, endangered stocks – in the waterways in French river basins, the situation of fisheries and catches and current measures and actions in support of this species. This plan proposes twenty actions to improve the management of fishers, to protect and restore salmon habitats, to restore stocks, to better manage aquaculture and to facilitate the exchange of information.

Moreover, with regard to water protection, mention should be made of the approval, in late 2009, of the first water "management plans" provided for in the 2000 Framework Directive on Water (DCE): these are the water development and management master plans (SDAGE). First introduced under the 1992 Water Act, these planning documents have evolved since adoption of the DCE. They establish, for a period of six years, the lines of direction that will make it possible to meet the expected objectives in 2015 with regard to the "good state of water".

Lastly, mention should also be made of the development of Natura 2000 at sea network, to which 76 sites were added at the end of November 2008, covering a surface area of 24 000 km^2 of France's three seaboards; in addition, four marine nature park projects have been launched.

Responses to the adverse impacts of fishing and aquaculture on non-targeted species and the environment

A number of measures within the fisheries management measures system, at both the EU and national level, aim to limit these impacts, and it is not easy to draw up an exhaustive list. However, it is worth mentioning Council Regulation (EC) No. 812/2004 of 26 April 2004 establishing measures applicable to accidental catches of cetaceans in fisheries.

Furthermore, work is in hand to make fishing gear more selective: reduction of by-catches of turtles in Guyana, reduction in bird deaths in FSATs (reduction of around 84% between 2007 and 2010). In addition, the DPMA has entrusted the French Development Research Institute (IRD) with the task of drawing up a guide to sharks, rays and rabbitfish, to be carried on board vessels and due to be finalised in August 2009.

It is also worth mentioning the continuation of the observation at sea programme (Obsmer) launched in 2003 in Brittany. This programme is being implemented at the national level of the DPMA in collaboration with IFREMER and professionals from industry (CNPMEM). A practical guide to on-board observation for use by professionals was drawn up in 2009 for the DPMA as well as an information brochure aimed at the general public.

Lastly, it should be noted that the CNPMEM and the Agency for protected marine areas have co-financed a study on inventorying such good practices in metropolitan France and overseas. The final report of these good practices was made available in November 2010.

Sustainable development initiatives

Plan for sustainable and responsible fishing (PPDR)

On 16 January 2008, the Minister in charge of agriculture and fisheries announced the launch of the Plan for sustainable and responsible fishing. Initially designed to be implemented over a period of 3 years, the PPDR stepped up and implemented in just two years, 2008 and 2009. Funding of EUR 310 million was earmarked for the plan. Although this plan was announced against a background of rising diesel fuel prices, it went beyond the economic aspects alone and aimed to provide a long-lasting response to the challenges faced by the French fishing industry: the environmental challenge, the social challenge and the economic challenge.

Blue contracts

Blue contracts are intended to encourage fishing practices that are particularly environmentally friendly and actions that will help to both protect and deepen our understanding of the marine environment.

The measures which were adopted in 2008 and 2009, or which could be included in subsequent blue contracts, meet several goals, namely to: *supplement and strengthen partnerships* between fishermen and scientists; *help conserve* the marine environment; *improve practices* with a view to increasing the sustainability of fishing; *empower professionals* be training them in the areas of resource conservation and protection of the marine environment.

Government financial transfers

Transfer policy

Most government financial transfers are make within the framework of the European Fisheries Fund (EFP) and through instruments used by EU regulations for market regulation. National expenditure, which is strictly limited, primarily concerns research fisheries inspection and, exceptionally, the compensation of victims of natural disasters.

Plan for sustainable and responsible fishing (PPDR): See above

The EUR 310 million budgetary envelope for the Plan is broken down as follows: EUR 260 million of government subsidies and EUR 50 million of EU subsidies. EUR 131 million of government funding were committed by as early as 2008. EUR 93 million were committed in 2009 and early 2010. The funding provided by the EU eventually amounted to EUR 55 million, for a total expenditure of around EUR 280 million. Several measures co-financed under EFP were implemented as part of the Plan (fleet withdrawal plans (PSF), temporary lay-ups in activity, blue contracts, pilot projects aimed at reducing energy dependence, etc.).

EFP instruments

The main instruments put in place and generating significant government financial transfers under the EFP are fleet withdrawal plans, temporary lay-ups and blue contracts.

Fleet withdrawal plans

The implementation of fleet withdrawal plans complies with European obligations and the general fishing effort adjustment plan (PGAEP) drawn up by the MAP.

To lend momentum to a rapid adjustment of fishing fleet capacity in the most sensitive fisheries (species whose stock levels are giving cause for concern and require a reduction in

the capacity of the fleet fishing for such species through the implementation of a fleet withdrawal plan), it is planned to assign EFP funding to the "fleet withdrawal plan" measure.

The sensitive species targeted in 2008 and 2009 are: bluefin tuna, cod (North Sea, Eastern English Channel, Celtic Sea and West Scotland), southern hake, Norway lobster (notably in ICES area VIIIc and IX, apart from the Gulf of Cadiz), sole (Western English Channel and Gulf of Gascony, eel, anchovy and deep-sea species.

The EFP budgetary envelope allocated to fleet withdrawal plans amounts to EUR 27 815 819. Under the fleet withdrawal plan measure, EUR 13 924 130.08 of EFP funding were paid out to 112 beneficiaries in 2009, representing 50.06% of the allocated envelope. From the start of the EFP (2008) until 31 December 2009, EUR 20 036 462.49 of EFP funding have been paid out to 183 fleet withdrawal plan beneficiaries, representing 72.03% of the allocated envelope. The contribution from the French government amounts to EUR 34 651 293.91.

Blue contracts

The funding provided in the plan for sustainable and responsible fishing (PPDR), for each of the two years (2008 and 2009), amounts to EUR 15 million of national funding, supplemented by EUR 3.72 million of EFP funding.

In 2008, the first year in which they were introduced, blue contracts had a significant impact in terms of the goal pursued. Almost 400 vessels performed actions aimed at protecting the marine environment (retrieval of lost fishing gear to reduce ghost fishing, and collection of waste found at sea). Around 200 vessels implemented measures aimed at improving selectivity and increasing minimum catch sizes and almost 100 vessels modified their practices in order to reduce the overall pressure on the resource (shorter fishing trips at greater distances to reduce pressure on coastal areas.

This participation by vessels which signed blue contracts in 2008, primarily with regard to the Atlantic, provided a solid basis for the initiative and attracted support. In all, 636 vessels were involved, mainly in Brittany and on the Atlantic seaboard. A funding package of EUR 12.9 million was put together, 20% of which consisted of EFP funding.

In 2009, the scope of action was extended to the North Sea, the English Channel and the Mediterranean. In addition, the range of measures was broadened, particularly in terms of partnerships between scientists and fishermen, selectiveness measures applied to passive gear (only dragged gear had been targeted in 2008) and collective training actions. Five collectives responded to the call for projects and 874 vessels were signed up. The funding envelope amounted to EUR 21.9 million, 20% of which in the form of EFP funding.

Temporary lay-ups

In 2008, EUR 3 371 944.71 of EFP funding was disbursed to 127 beneficiaries and in 2009 EUR 1 648 063.93 of EFP funding was disbursed to 305 beneficiaries, representing an overall total of EUR 5 020 008.64 of EFP funding paid to 432 beneficiaries. The French government's share amounted to EUR 10 002 339.59.

Social aid

National expenditure (other than national aid matched to EU aid) primarily concerns management and surveillance, research technical support and maritime training, as well as payments to cover breaks in resource harvesting (unemployment benefits during bad weather, which between 2008 and 2010 amounted to around EUR 6.8 million). Indeed, it should be noted that provision is made for socio-economic aid in the EFP (see above).

Post-harvesting policies and practices

Policy developments

Food safety

The MAP (General Directorate for Food – DGAL) which is responsible for government policy relating to food safety in France, including fishery and aquaculture products.

Since 2002, a major reform to the EU Plan has been underway in this area, with the adoption and implementation of the so-called "Hygiene Package" regulations. The Hygiene Package legislation generally lays down the following requirements: compliance with good hygiene practices, introduction of procedures based on the HACCP principles, use of the validated guide to good hygiene practices and application of the HACCP, requirement to training employees, requirement to declare and register all establishments.

Lastly, it should be noted that at the international level France (notably through the DGAL) actively participates in the *Codex Alimentarius* with regard to fish and fishery products.

Information and labelling

Regulation (EC) No. 2065/2001, applicable since 1 January 2002, lays down rules regarding the information that must be given to consumers of fishery and aquaculture products. The trade name, catch area or country where the product has been farmed, and the mode of production are the three mandatory items of information that must be displayed on sales stands.

Structures

Modernising and improving the competitiveness of the fishing sector (distribution/ marketing) cover the following main lines of action: *improvingthe conditions under which fish are landed and initially placed on sale,* in particular through systems designed to announce catches prior to landing, harmonisation of fish auction grading practices, collective investment in fishing ports and wholesale fish markets; *modernising enterprises downstream* in the industry (fish trading and processing), particularly in terms of product quality, traceability and identification; and *developing innovation and research* into new processes at every stage of the industry, be it production and marketing, quality enhancement or new products.

These strategic areas correspond to domestic and EU policies in the same field. The operations featuring in this drive receive – and will continue to do so in years to come – both EU support (under the 2007-13 FIFG programme) and domestic support (government and/or OFIMER, including "contract plan" aid drawing on local authority funding.

Processing and handling facilities

The processing sector, which produces frozen products, canned products and chilled delicatessen products comprised 214 firms in 2008 generated a combined turnover of EUR 3.151 billion and employing 12 000 people (source FranceAgriMer, 2010). The French processing industry primarily utilises imported products, particularly salmon, Alaska Pollack, shrimp, tuna and scallops. In contrast, there are few exports, primarily canned tuna.

Canned products account for 14% of turnover in the sector in 2009 (sharply down by almost 50% since 2003), frozen produce 21% (stable), pickled and preserved products 36% (sharply up by 42% since 2003).

This is an expanding industry. Markets such as delicatessen or smoked produce are growing by over 7% a year. The seafood delicatessen market is forecast to triple in volume over the next ten years.

The vast majority of processing enterprises are located in coastal regions. However, a non-negligible number of processing firms are also to be found in other regions in France, generally near to major consumer cities.

The fish and seafood processing industry, even more than the fish trade itself, is characterised by a very large number of small enterprises making a small contribution to total turnover, and by a small number of larger enterprises accounting for the lion's share of industry turnover.

Markets and trade

Markets

General

In 2009, 4 857 vessels and 15 062 seamen were involved in maritime fishing in metropolitan France, representing 10 840 FTE jobs (*source:* FranceAgriMer).

Fishery products are sold in part through Producer Organisations (POs – in the sense of Council Regulation (EC) No. 104/2000 of 17 December 1999). In 2011, there were 21 POs operating in metropolitan France. They are highly representative, particularly in Normandy and Brittany where 50% and 34% of fishermen respectively are members.

In 2009, fresh fish were landed at 1 400 points and 419 ports and placed on sale in 40 approved fish markets distributed along the French coast. 62% of fresh fish is sold at auction.

In 2009, the three leading fish auctions (Boulogne-sur-Mer, Le Guilvinec, Lorient) accounted for 34% of sales. The financing of fish markets is provided through a tax levied on the value of the products sold (at an average rate of 4%), for a national total of around EUR 21.5 million, with variations from one port to another in terms of both the tax rate and the breakdown between buyers and sellers.

Given the size of French fishing zones, less than two-thirds of catches are landed in metropolitan France. Not only is tropical tuna delivered directly to the countries where it will be canned, but also several French fishing vessels land their catches in Scotland from where they will be shipped to France by road; in addition, some vessels land and sell their catches directly in Spanish fish auctions or in the Netherlands.

The turnover from sea fishing in 2008 in metropolitan France amounted to slightly over EUR 1.5 billion (including landings abroad). Brittany is the leading producer region accounting for 22.0% of sales in terms of value, followed Nord-Pas-de-Calais with 6.2%. Direct sales abroad accounted for 12.8% of sales in value terms.

Lastly, 3 125 fishermen on 2 410 vessels are involved in sea fishing in the overseas *départements* (DOM). The turnover from sea fishing in the DOM amounted to EUR 160 million in 2008.

Fish trade

The purchasing at auction and distribution of products is ensured by 374 fish traders, whose turnover amounts to a total of EUR 2.2 billion and generates approximately 5 250 FTE jobs (*Source:* FranceAgriMer, 2009). Imports account for around a third of purchases by fish traders in terms of value. Fish trade exports are worth EUR 300 million, *i.e.* 15% of total turnover. Fish trading businesses are established in almost all coastal regions.

The fish trading sector is divided between a few major enterprises and numerous small enterprises in that 50% of total turnover is generated by merely 8% of firms, whereas the remaining 50% of turnover is generated by 82% of firms.

Trend in domestic consumption

Average consumption in 2008 amounted to 34.5 kg per inhabitant and per annum in equivalent live weight.

All species taken together, consumption of fishery and aquaculture products in 2009 amounted to around 2.22 million tonnes in equivalent live weight, over three times domestic production which in 2009 amounted to 673 000 tonnes.

All products taken together, supermarkets accounted for 73% (in volume terms) of the distribution of fishery and aquaculture products, and fishmongers and markets for 5%. However, this breakdown depends on the type of product.

Promotional efforts

The main actions in terms of the promotion and advertising of fishery and aquaculture products in France are taken by FranceAgriMer, the national agency for agricultural and marine products. These actions are pursued with the framework established by Regulation (EC) No. 2792/1999 of 17 December 1999 setting out the procedures and conditions for structural actions by the EU in the fisheries sector.

Trade

Volumes and values

Imports

The volume of imported products is large and in 2009 amounted to 2.181 million tonnes in equivalent live weight. 54% of these imports, which cost EUR 4.04 billion in 2009 (*Source:* FranceAgriMer through French customs and excise), came from European countries and 46% from the rest of the world. France's main European suppliers in 2009 were Norway (EUR 454 million in terms of value – salmon, cod), the United Kingdom (EUR 364 million in terms of value – salmon, Norway lobster, scallops, white fish fillets), Spain (275 million in terms of value – canned tuna, whiting, cephalopods), the Netherlands (EUR 183 million in terms of value – shrimp, sole, mussels, white fish fillets) and Denmark (EUR 156 million in terms of value – cod, white fish fillets). In the case of the latter last two countries, the products imported have often come from outside the European Union and have simply transited through these EU countries. Outside Europe, our main supplier remains the United States (EUR 160 million in terms of value), followed by China (EUR 153 million in terms of value) which is becoming increasingly present in the French market.

The species imported vary substantially in terms of their geographical origin and mode of production (in volume terms, frozen products account for the bulk of imports), although six products account for over half of France's imports in terms of value: salmon (EUR 689 million), shrimp (EUR 525 million), tuna (EUR 452 million), cod (EUR 254 million), scallops (EUR 213 million) and pollack (EUR 204 million). In addition to traditional species, an increasing variety of fresh tropical fish is to be found on the market. There is also increasing demand from the French market for fresh farmed tropical fish.

Imports, which had declined slightly in recent years (–2% in net weight between 2005 and 2008), started to rise again in 2009. This increase (in terms of both volume and value) primarily concerned salmon, tuna, cod, scallops and sardines. In contrast, imports of pollack and hake declined (in volume terms) between 2008 and 2009.

Exports

France is also an exporting country. French exports of aquatic products intended for human consumption amount to 614 000 tonnes in equivalent live weight worth EUR 1.185 billion in 2009 (source FranceAgriMer according to French customs authorities). Three quarters of these exports remain concentrated within the European Union, particularly to Italy (EUR 283 million in terms of value) and Spain (EUR 207 million in terms of value). Moreover, French exports to China have also experienced strong growth, in terms of both value and quantity (of around 30%).

French exports have fallen sharply in recent years (–18% in net weight compared with 2006) and were down to 355.3 thousand tonnes in 2009 (in net weight). This decline (between 2008 and 2009; in volume and value terms) primarily concerns frozen marine products; dried, salted and smoked products; live, fresh, refrigerated fish; shellfish and cephalopod preserves.

PART III

Chapter 11

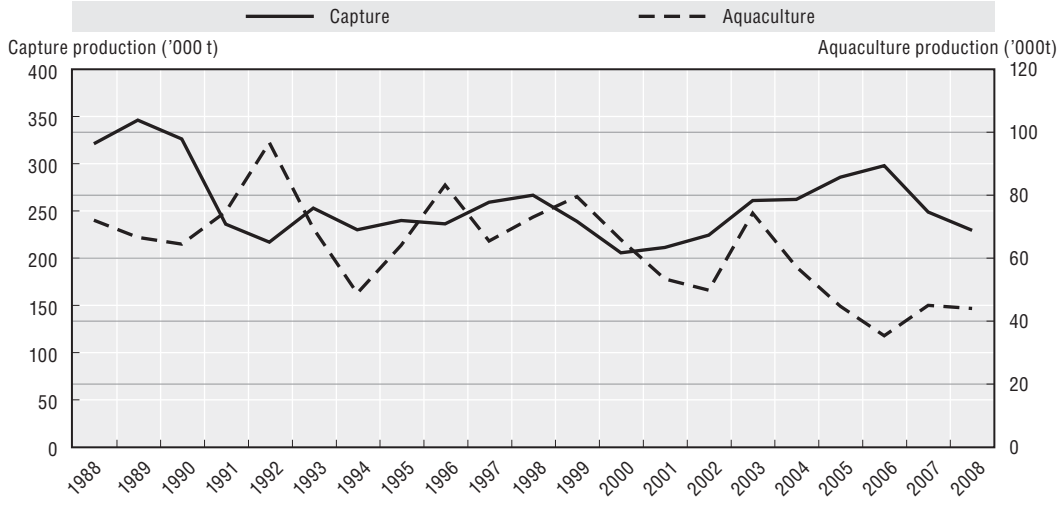
Germany

Germany

Summary of recent developments

- In 2009, the German fisheries sector experienced a reduction in landings compared to previous years. Rapidly increasing fuel prices had a negative impact on the overall results.
- With a degree of self-sufficiency of merely 21%, the processing industry and consumers are heavily dependent on imports from other EU Member States and from third countries.
- The per-capita fish consumption increased to 15.7 kg in 2009. The most important species for consumption are pollock, herring, tuna and salmon. In 2008-09, the Fish Information Centre (FIZ) organised stands at trade fairs, radio programmes, the provision of information material and the answering of questions. An interactive world map showing fishing grounds of the most important sea fish marketed in Germany was launched on the FIZ website in 2009.
- Two new inspection vessels started service in 2008 and 2009. Their main areas of operation are the North and Baltic Sea and the North Atlantic. A new research vessel has been commissioned and will begin service in 2011.

Harvesting and aquaculture production (tonnes)

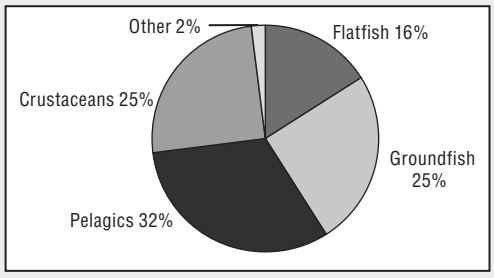


Source: FAO FishStat Database.

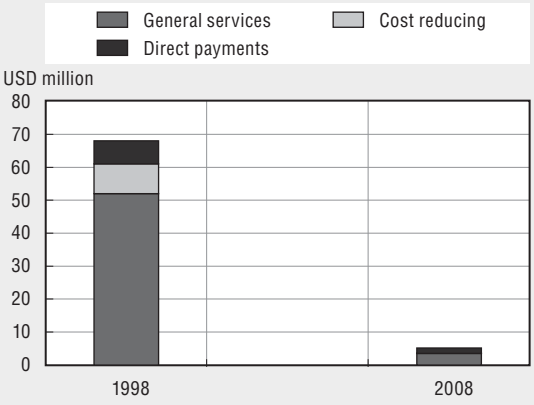
Key characteristics of the sector

- The total value of landings decreased between 2008 and 2009 to EUR 175.1 million as prices for the main commercial species decreased. In 2009, the revision of the catch effort system in the North Sea introduced a kW-days scheme in addition to the quota system, tightening conditions for the German fisheries sector.
- For 2007-13, about EUR 155 million of the European Fisheries Fund have been allocated to Germany. In 2008 and 2009, the funds were mainly allocated to innovative measures, processing and marketing, and aquaculture.
- In 2009, import prices increased by 6% due to the appreciation of the dollar. Germany continues to have a negative trade balance for fishery products; China is the main supplier to the German fish market.
- The decrease in the German fleet affects mostly the small-scale segment. As the fleet is subject to EU structural policies, no increase in terms of numbers or capacity is possible. The North Sea is the most important area of activity for the German fleet.

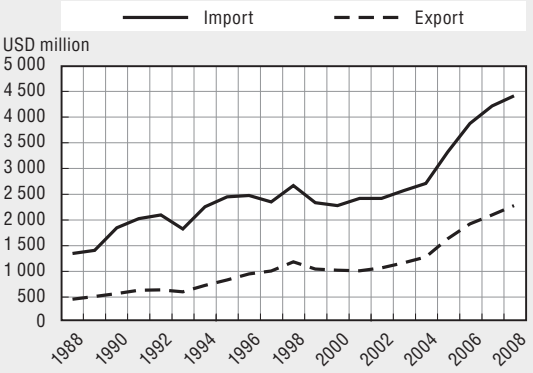
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD million)



Capacity

	2000	2009	% change
Number of fishers	4 330	1 932	–55.4
Number of fish farmers	n.a.		n.a.
Total number of vessels	2 328	1 769	–24
Total tonnage of fleets	79 452	68 000	–14.4

Legal and institutional framework

The German fisheries policy is fully integrated in the Common Fisheries Policy (CFP) of the European Union. Within the Federal Government, responsibility for sea and inland fisheries as well as for aquaculture matters lies with the Ministry of Food, Agriculture and Consumer Protection, (BMELV). Implementation of the CFP rules, primarily translated into national law by the Sea Fisheries Act, is incumbent upon the Länder in close co-operation with the BMELV.

Capture fisheries

Performance

Since 1 January 2008, Germany's fishing fleet has decreased by approximately 100 fishing vessels. These changes mostly affect vessels of small-scale coastal fisheries. The capacity and the number of vessels have largely remained the same in the deep-sea fisheries sector and for large cutters with a length of 18 metres and more. Hence, the German fishing fleet currently consists of 1 769 units with a total tonnage capacity of 68 000 GRT (gross register tonne) and an engine power of 161 500 kW. Only nine of these vessels are engaged in deep-sea trawler fishing. Due to their structural characteristics, they meet the pre-conditions required for conducting fishing activities in Community waters as well as in third country and international waters that are managed by regional fisheries organisations. All vessels of this fleet category process and freeze their catch at sea, and thus also supply top-quality fish products from remote areas. The fishing grounds of the remaining German fishing fleet are located predominantly in the North and Baltic Sea. Many of these vessels are open vessels and smaller cutters engaged mainly in daylight fishing. The fleet's development is subject to the structural policy adopted by the European Community. An increase in fleet capacity is therefore impossible.

Table 11.1. **Structure of the German fishing fleet as of 31.12.2009**

Total length	Number	Engine power in kW	Tonnage in GRT
< 10 m	1 302	23 318	2 375
10-12 m	101	9 448	1 177
12-15 m	61	9 557	1 339
15-18 m	143	27 070	4 862
18-24 m	100	21 390	7 507
24-40 m	43	22 844	9 011
> 40 m	19	47 880	41 891
Total	**1 769**	**161 507**	**68 161**

In 2008, the total landings of German fishing vessels was 248 000 tonnes (landed weight) of fish and fish products. Landings decreased to 213 000 tonnes in 2009. At the same time, the value decreased from EUR 216.6 million to EUR 175.1 million. Prices for many economically important fish species declined. Fuel and energy prices that had been increasing for some years have placed a strain on operating profits.

In 2009, deep-sea fishing vessels contributed 107 000 tonnes of product to total landings, of which 16 000 tonnes were unloaded in Germany and 91 000 tonnes abroad.

The revision of the catch effort system in the North Sea, which is the main fishing ground for the German cutter and coastal fisheries, placed a further burden on the fisheries sector. Alongside the quota system, the kW-days scheme was introduced as the second limiting instrument designed to manage fisheries; this scheme has been applicable since 2009. This has tightened conditions for the German fisheries sector, thus further increasing the burden on companies.

Management of commercial fisheries

During the period under review, 2008-09, there were no substantial changes in fisheries management in Germany. New fishing vessels can still only be put into service if at the same time old vessels of at least the same tonnage (GRT) and engine power (kW) are permanently decommissioned. Modernisation measures of existing fishing vessels that lead to increased tonnage and engine power are only authorised if corresponding old capacities are withdrawn. This ensures that the fishing capacity of the fleet does not grow. It should also be mentioned that the capacity ceiling established by the European Commission for the German fleet has not been fully utilised.

The principles of the Sea Fisheries Act were adhered to when quotas were allocated during the period under review. However, some details of the distribution systems were adapted to the current requirements. The quota cuts, in some cases very sever, in combination with higher operating costs, are threatening the livelihood of an increasing number of fishing companies. This has led to more and more protests by the most affected members of the sector. The European Union's complicated requirements, which are difficult to control, have further increased the administrative burden for the quota management. A large number of newly introduced specific provisions concerning the use of quotas make control of the use of quotas even more difficult. The effects of the global financial crisis (extremely low producer prices for traditional species of fish) and the on-going parallel management of quotas and catch efforts have caused additional economic problems for the fisheries sector.

Management of recreational fisheries

The number of active recreational fishers in Germany is estimated at 1.6 million. A basic pre-condition to acquire an angling licence, a prerequisite for engaging in line-fishing, is to provide evidence of extensive knowledge of fishery biology, hydrology, and animal welfare and water conservation. It is now possible in some *Länder* (federal states) to acquire an angling license of strictly limited validity without recognised qualifications. As there are no catch records providing universal coverage, information on catches made by anglers is based on estimates. These estimates are approximately 16 000 tonnes (about 10 kg per angler). Catches may not be commercially marketed. The *Länder* have, in part, adopted different rules governing closed seasons and the minimum size of the fish concerned. Moreover, there are usually restrictions in place on fishing gear and catch levels that are specific to the water body being fished.

Monitoring and enforcement

The first of two new modern fishery inspection vessels, the "Seefalke", was put into service in November 2008. In May 2009, the second new vessel, "Meerkatze", was handed over to the Federal Agency for Agriculture and Food (BLE). The old vessels were taken out of service and sold by the Federal Disposal Sales and Marketing Agency. The new vessels

are equipped with state-of-the-art navigation, machine, communication, and IT technology. Both new vessels have already demonstrated their operational capability in the most adverse weather conditions. The vessels are designed to be deployed across the world. Their main areas of operation are the North Sea, the Baltic Sea, and the North Atlantic. In August 2009, the BLE commissioned the Fassmer shipyard in Berne with the construction of a 27-metre fishery research vessel. This new vessel will replace the 61-year-old fishery research cutter "Clupea", probably in August/September 2011.

Aquaculture

Except for shellfish, aquaculture is mainly operated inland. The responsibility for inland waters fisheries rests with the individual federal states so that there is no direct aquaculture policy of the Federal Government. However, some federal acts have an impact on the aquaculture installations: the Federal Water Act, the Animal Welfare Act, veterinary legislation and the Federal Nature Conservation Act, to mention but a few examples. There have been no major changes for aquaculture installations in the period under review. The authorisations under water law that are frequently handled in a restrictive manner often prove to be an obstacle to the expansion of aquaculture production in Germany, *e.g.* in the form of net cage systems.

In addition, the concerns of aquaculture producers are also affected by EU directives that are implemented by the individual federal states. The main directives of relevance in this regard are the FFH Directive, the Water Framework Directive and the Wild Birds Directive. Implementation, which differs significantly across federal states, often results in excessive restrictions on the entrepreneurial freedom of producers in some regions. This especially concerns carp pond farming which covers a comparatively large area. The problem posed by cormorants constitutes a major conflict of interests between bird protection and aquaculture.

Directive 2006/88/EC concerning the designation of aquaculture installations and areas as free from specific fish diseases is of relevance for aquaculture in Germany. The number of disease-free farms currently amounts to 119. Eleven areas have also obtained the disease-free status. Germany is recognised to be free from infectious salmon anaemia (ISA).

The federal authorities only record shellfish production directly. Its volume fluctuates greatly, depending on the availability of larvae, and amounted to around 6 896 tonnes and EUR 9.7 million in 2008 and to 3 630 tonnes and EUR 4.5 million in 2009.

The aquaculture production in inland waters, on the other hand, is recorded or in some cases only estimated by the individual federal states. This type of aquaculture is relatively stable in spite of minor fluctuations. Over 440 full-time flow-through systems and 10 300 part-time flow-through systems produce on annual basis about 22 000 tonnes of rainbow trout for consumption, 3 000 tonnes of rainbow trout for stocking, and about 3 000 tonnes of additional species (mainly common trout and char) for a total value of over EUR 130 million. Carp pond farming is the second largest aquaculture segment and annually produces around 11 000 tonnes of food carp, 4 000 tonnes of carp for stocking, and around 1 000 tonnes of additional species (other cyprinids, *percidæ*, catfish, pike, common sturgeon, small fish species) with a total value of EUR 50 million in around 200 full-time farms and around 12 000 part-time farms. Technical fish farming facilities (closed recirculation systems) are less important. There are around 30 installations in the Federal Republic of Germany and their total output exceeded the 1 400 tonnes mark for the

first time in 2008. This production method is used to produce relatively high-priced fish species such as eel, European catfish, carp for stocking, sturgeon, striped bass and pike-perch with a total value of around EUR 7 million. Minor quantities of rainbow trout, sturgeon, carp and pike-perch are produced in around ten net cage systems, their value adds up to around EUR 1 million.

Fisheries and the environment

In 2004, Germany reported ten marine protection areas in the German exclusive economic zone in accordance to NATURA 2000 to the European Commission. Equivalent management measures should be developed until 2013, and which will also concern fisheries. Working groups in the German Government are working on these procedures.

Government financial transfers

The financial support provided by the FIFG Structural Fund (Financial Instrument for Fisheries Guidance) for the period 2000-06 was substituted in 2007 by the European Fisheries Fund (EFF). For 2007-13, the amount granted to Germany is about EUR 155 million. Responsibility for the implementation of funding programmes lies with the *Länder*, with the federal government playing only a minor role. Funding priorities from 2007 to 2013 include the following sectors:

- processing and marketing;
- protection of fauna and flora of water;
- aquaculture;
- innovative measures;
- fisheries areas.

Grants of EFF in 2008 and 2009 were mainly used for innovative measures, processing and marketing, and aquaculture.

Post-harvesting policies and practices

An agreement was reached at EU level that the Community should set minimum requirements when introducing an EU eco-label for fisheries products, but leave the detailed arrangements to the economic operators. Official monitoring would be confined to checking compliance with the minimum requirements.

Markets and trade

Markets

Trends in domestic consumption

In 2008 and 2009, fish consumption remained at the high levels of the previous year. While the first three-quarters of 2008 saw an upward trend, the economic climate started to cool off significantly afterwards and throughout 2009. Surprisingly, fish consumption was not negatively affected by the economic and financial crisis. On the one hand, measures by the Federal Government aimed at stimulating economic recovery helped to support demand. Payments to part-time workers, in particular, helped to keep unemployment from rising further and increased incomes. On the other hand, declining energy prices in 2009 eased pressure on consumers. Many employees saw their real wages increase due to salary increases. Per-capita consumption amounted to 15.5 kg in 2008.

According to preliminary data, German citizens consumed 15.7 kg of fish and seafood in 2009. As regards the distribution of fish consumption among the various product categories, a shift occurred towards the deep-frozen segment that accounted for over one-third. Canned fish and marinades make up just under one-third of all fishery products. Fillets and fish sticks of Alaska pollock dominated the frozen food segment with the demand chiefly focused on canned herring and herring marinades. Fresh fish (trending downwards), smoked fish, fish salads and other fisheries products were consumed less frequently. Alaska pollock was again the most frequently consumed fish in Germany for the period under review. This species accounted for slightly less than 18% of fish consumption in 2009. It is followed by herring and salmon ranking second and third on the list of the most popular fish species.

The share of aquaculture fishery products in the German market grew steadily. Hence, fishery products from the category freshwater fish (including salmon) that mainly contains fish from aquaculture covered almost 25% of the entire domestic market for fishery products in 2009. Crustaceans and molluscs, some of which are provided by aquaculture, also showed a slight upward trend with a market share of around 11%.

Promotional efforts

In 2008-09, the Fish Information Centre (FIZ) engaged in a number of different activities aimed at promoting fish consumption in Germany. These included stands at trade fairs, radio programmes, the provision of information material, and the answering of questions. An interactive world map showing fishing grounds of the most important sea fish marketed in Germany was launched on the FIZ website in 2009. In addition to the respective fishing grounds, the map also provides fact files with information on biology and population stocks of the species. This project has been conducted with the support of the Institute for Baltic Sea Fisheries and with the financial participation of the BMELV. The Federal Government also supported the Fish Information Centre's exhibition at the Green Week consumer trade fair which is held annually in Berlin, and which in 2009 was for the first time co-financed with funds from the European Fisheries Fund. The exhibition at the trade fair concentrated on promoting herring. A further measure at the federal level is the trout advertising run by the German Inland Fishery Federation. These activities are exclusively funded by private operators and not by the public sector. Moreover, some regional fishery and tourist associations are engaged in regional advertising campaigns that are, in part, supported by the municipalities or federal states.

Trade

Volumes and values

The Federal Republic of Germany still mainly obtains its supply of fisheries products through imports. The degree of self-sufficiency reached its lowest level in 2009 at 21%. The volume of foreign trade decreased as a consequence of the crisis. The drop in fish exports was more severe that in imports. All in all, import and export prices for fish and fishery products increased considerably in 2009. Import prices increased by 6% due to the appreciation of the Dollar. Export prices saw an above-average increase of almost 25%.

The dominance of import trade in supplying the market with fishery products is reflected in the negative balance of trade for this economic sector.

The dependence on imports was particularly high for frozen white fish fillets, salmon and tuna products. The share of German catches in the total volume of mackerel during the period under review increased to more that 100%. Traditionally, commercial transactions have been conducted mainly with partners from third countries. Thirty-six per cent of deliveries originated within the Community. China was the most important single supplier of fish and fishery products, ahead of Norway, and was instrumental in ensuring that the German market was supplied with adequate quantities of fishery products, notably in the case of frozen fillets. Denmark and France were the most important Member States in the European Union.

Table 11.2. **German fish trade, 2008-09**

	Import		Export		Balance of trade	
	Amount in tonnes	Value in EUR '000	Amount in tonnes	Value in EUR '000	Amount in tonnes	Value in EUR '000
2008	956 707	3 100 264	609 233	1 563 964	–347 474	–1 536 300
2009	886 949	3 048 753	466 382	1 348 878	–420 567	–1 699 875

Policy changes

The initiative aimed at preventing, deterring and eliminating illegal, unreported and unregulated fishing by the Commission and the EU Member States was launched at the beginning of 2010. A key element of this initiative is the new catch certificate rule which is enshrined in the IUU Regulation. According to this rule, since 1 January 2010 imports of fishery products from third countries must be confirmed by catch certificates. In order to guarantee the legality if the certificate, only third country authorities which have in advance been approved by the Commission are allowed to issue these certificates. An intensive information policy helped to overcome minor initial problems which occurred towards the beginning of 2010. Thanks to good co-operation between the authority and economic operators, the procedure is running smoothly.

PART III

Chapter 12

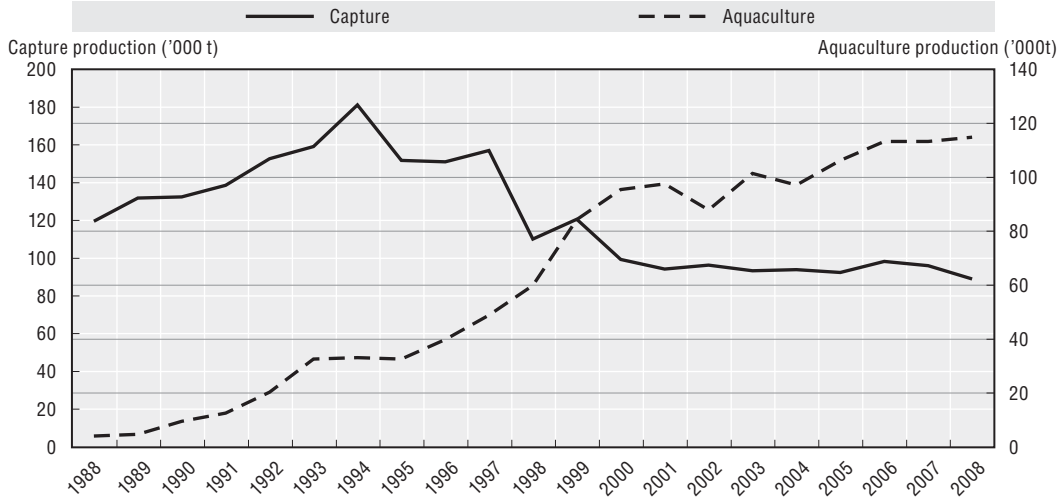
Greece

Greece

Summary of recent developments

- The increased recognition of fisheries and aquaculture in Greece is reflected by the passage of competency of the sector in October 2010 from the Ministry of Rural Development and Food to the Ministry of Marine Affairs, Islands and Fisheries.
- The responsibility for control and enforcement was transferred at the end of 2009 from the Ministry of Mercantile Marine, Aegean and Island Policy to the Ministry of Citizen Protection.
- The aquaculture sector continues to grow, mainly due to the production of sea bass and sea bream, and to tuna fattening activities. The legislative framework for aquaculture was revised in 2008 and 2009 to ensure the sustainable development of the sector.
- With respect to capture fisheries, Greece implemented further measures in 2008-09 in line with international stock conservation and management agreements (ICCAT, GFMC). This applies in particular to tuna and sword fish stocks.
- In order to support domestic consumption, a campaign was started in 2007. The campaign included the publishing of leaflets with consumer information as well as TV, radio and newspaper ads.

Harvesting and aquaculture production (tonnes)

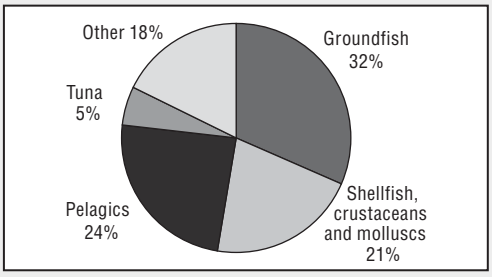


Source: FAO FishStat Database.

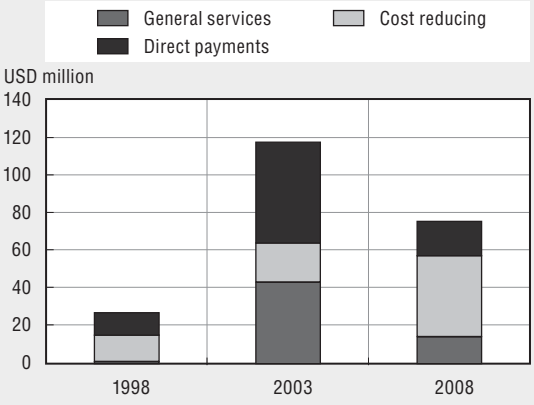
Key characteristics of the sector

- The main species caught by the Greek fleet are small pelagics, such as anchovy and sardines, bogue, hake, picarel and chub mackerel.
- Efforts are being made to improve stock assessment given that some commercial stocks are particularly under pressure.
- EU funds and national support for marine fisheries were mainly directed to the adaptation of the fishing effort, the modernisation of fishing vessels, accompanying measures of a socio-economic nature, appropriate measures for the support and enforcement of small scale coastal fishing, the use of new technologies, and the construction, extension and improvement (modernisation) of fishing ports.
- Italy, Spain, the United Kingdom, and Germany are important export markets, accounting for about 50% of the total production of fish and shellfish.
- Considerable investments were made to modernise processing plants with HACCP procedures and according to ISO standards. In order to increase domestic consumption, information campaigns were carried out.
- The Greek fishing fleet consists mainly of small-scale coastal fishing vessels with a total length of less than 12 metres. The fleet has been reduced over time to become more profitable.
- In line with a decreasing fleet, employment in the capture sector continues to decline while aquaculture provides new employment opportunities, especially in certain coastal areas where no other economic activity takes place.

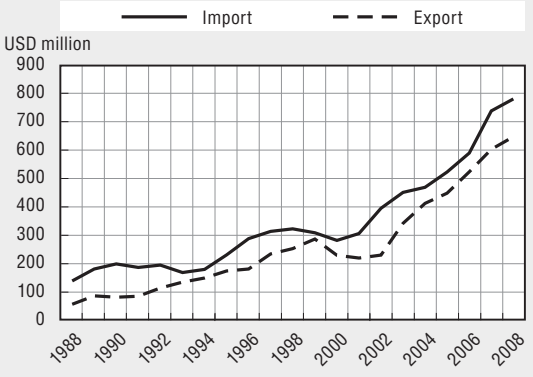
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD million)



Capacity

	2000	2008	% change
Number of fishers	37 626	29 313	–22.1
Number of fish farmers	6 564	6 657	1.4
Total number of vessels	20 091	17 651	–12.1
Total tonnage of fleets	108 547	88 900	–18.1

Legal and institutional framework

The Ministry of Rural Development and Food (MRDF) had the authority to develop and implement marine fisheries and aquaculture policies at the national level. It also had the responsibility for the implementation of the rules of the Common Fisheries Policy and of national measures for the conservation and management of fish stocks. Furthermore, the MRDF had the responsibility for the issuing of additional regulatory measures for the performance of capture fisheries in the Greek territorial waters.

In October 2010, the competence over fisheries and aquaculture was given to the Ministry of Maritime Affairs, Islands and Fisheries.

With respect to co-responsibility issues, the MRDF co-operates with the correspondent ministries and especially with the Ministry of Mercantile Marine, Aegean and Island Policy, the Ministry of Citizens Protection, the Ministry of Physical Planning and Environment, the Ministry of Employment and Social Security, the Ministry of Development and the Ministry of Internal Affairs.

The legislative framework in force for marine fisheries operations consists of:

- the provisions of the Common Fisheries Policy (Reg. [E.C.] No. 2371/2002) and rules which regulate relative issues at EU level;
- the provisions of the Fisheries Code (L.P. 420/70) as amended and being in force, and the presidential decrees and ministerial decisions issued within this framework.

Recreational fishing is regulated by national and community legislation. National legislation includes provisions concerning the use of specific fishing gears, determining the highest permitted fishing quantities, as well as time and local closures. Trade of catches is prohibited by amateur fishers. The above provisions are stricter than the respective Community legislation.

In 2008 and 2009, the legislative framework for aquaculture was significantly improved regarding the use of the waters, the protection of the environment, fish health, and production hygiene.

All farming of fish and shellfish in Greece requires a license from the Regional Fisheries Authorities. There is also a system of limited entry for sea bass and Gilthead sea bream in order to control their reproduction. No new licenses have been issued since August 1994. A limited entry of new licenses is in place for some Mediterranean species such as common sea bream, sharpsnout sea bream, white sea bream, red porgy and common dentex.

In 2009, a new Ministerial Decision was issued to regulate the licenses regarding cultured species in marine fish farms. This replaced previous Decisions (2007, 2008) and aimed to reduce administrative burden.

In 2008, a circular was issued concerning the obligation to obtain a license for the use of water. This circular applies both to fish farming in floating cages and shellfish farming in the sea, and generally to aquaculture farms in coastal waters.

The development of the Specific Framework for Spatial Planning and Sustainable Development for Aquaculture started in 2009 and continued in 2010.

In 2009, a circular was issued in order to specify the parameters for the functioning of aquaculture farms, including the annual production level, based on scientific data.

In 2009, two circulars were issued concerning the obligation to obtain a veterinary license and a code number for each aquaculture farm.

Capture fisheries

During 2008-09, the marine fisheries sector followed the major objectives of the Common Fisheries Policy and the national policy in the following way:

- rational management of fish stocks within the context of their sustainable exploitation;
- protection of aquatic species and ecosystem;
- management of the fishing capacity of the fleet;
- strengthening of the control and the inspection of fishing activities for fighting of illegal fishing;
- financial support for the fisheries sector through the implementation of structural measures.

The marine fisheries sector is very important for Greece due to its economic, social and cultural contribution to the coastal areas of insular and continental Greece.

Fishing fleet

The Greek fishing fleet consists of three basic vessel categories depending on their activity:

- fishing vessels, equipped with static gears;
- fishing vessels, fishing with towed gears; and
- fishing vessels, fishing with surrounding nets.

Table 12.1. **Total number of fishing vessels, 2007-09**

	2007		2008		2009	
	Number	Total GT	Number	Total GT	Number	Total GT
Vessels with engines	17 274	90 487	17 069	88 751	16 983	87 923
Vessels without engine	306	154	299	146	293	142
Total vessels	**17 580**	**90 641**	**17 368**	**88 897**	**17 276**	**88 065**

The greatest percentage of fishing vessels (93.8%) is small-scale coastal fishing vessels (total length less than 12 m).

The number of people employed in marine fisheries was estimated to be 30 120 in 2008 and 29 931 in 2009. Data for part-time employees are not available.

The management of the fishing fleet follows the rules of the Common Fisheries Policy in accordance with which the Member States apply measures to adjust fishing fleet capacity to achieve a stable balance between fishing capacity and fishing possibilities.

Management and conservation of fisheries

The fishing operation by Greek fishing vessels is regulated through the following provisions:

- The Common Fisheries Policy (Reg [E.C.] No. 2371/2002).

- The (Reg [E.C.] No. 1967/2006), for the community and international waters of the Mediterranean Sea.
- The Greek legislation which includes regulatory measures for fishing in the Greek territorial waters, concerning:
  - area and time restrictions;
  - technical specifications for the fishing gears;
  - minimum size of the harvested species; and
  - regime of issuing general licenses and special fishing permits.

Furthermore, international measures for the conservation and management of fish stocks are implemented (ICCAT and GFCM/FAO). The legislative and regulatory measures for the Golf of Salonika and Thermaikos (Presidential Decree 68/2009) and for the Golf of Lakonia, bay of Vatikon (Presidential Decree 16/2009) have been issued during the period 2008-09.

For highly migratory species, blue fin tuna (*Thunnus thynnus*), sword fish (*Xiphias gladus*) and long-finned tuna (*Thunnus alalunga*), the Community legislation, which is in harmony with ICCAT and GFCM recommendations, applies. The fishing of the above species is carried out by vessels equipped with a specific annual fishing permit, in addition to the professional fishing license.

Especially the blue fin tuna fishing for 2008 and 2009 was conducted according to the regulations Reg. (E.C.) No. 520/07, 1559/2007 and 302/2009 of the Council through which the European Union adopted the ICCAT decisions and recommendations.

The specific fishing permit for blue fin tuna (*Thunnus thynnus*) is no longer valid after the yearly allocated quota is exhausted, which was 677.5 tonnes and 362.40 tonnes for 2008 and 2009 respectively.

With the ICCAT recommendation No. 08-03, also adopted by the GFCM with the equivalent 2009/9A, fishing of sword fish was prohibited from 1 October until 30 November. According to the national legislation, fishing, trade and retail of sword fish was already prohibited during October, November, December and January each year.

Within the framework of Community legislation, ports were designated in which catches that come from the use of certain fishing gears (bottom trawl, purse seine, surface longlines and dredges) are allowed to be landed and traded. Furthermore, ports for the landing of bluefin tuna were designated.

Stock assessment

Stock assessment is focused on the most important species that constitute the target of fishing activities and are based on studies and research programmes. Particularly, within the framework of the national programme of fisheries data collection, samplings were carried out in specific areas in 2008, using MEDITS protocol, and for bottom trawl gear for scientific stock evaluation.

Furthermore, studies were finalised by universities and research institutions. They refer to specific species and areas and aim to assess fish stocks, sustainable management, and the use of more selective fishing gears.

In addition, activities by professional fishers having common interests were promoted, as were studies and pilot experimental work on the use of more selective fishing gears and environmental protection.

Access

Fishing in national territorial waters is allowed only for vessels flying the Greek flag and having a vessel fishing license, issued according to the Reg. (E.C.) No. 26/2004 and 1281/2005 of the European Commission.

Fishing in international waters is allowed only for professional fishing vessels provided that they are supplied with specific permission for fishing with up to one year duration, according to the national legislation.

Within the framework of the fishing agreements concluded between the European Union and third countries, Greece took advantage of a percentage of the fishing capacity that was assigned to it from the Community share based on historical rights. Greece also made use of the fishing possibilities that were assigned by other member states after being only partially used by them. This regards in particular the fishing agreements of the European Union with Guinea Conakry for 2008, and with Guinea Bissau and Mauritania for 2008 and 2009.

Recreational fisheries

A significant number of amateur fishers are engaged in recreational fishing. There were approximately 230 000 in 2008; it is estimated that this number would remain stable in 2009.

Monitoring and control

The control of fishing activities and the enforcement of current legislation is performed by the competent authorities of the Ministry of Mercantile Marine, Aegean and Island Policy; at the end of 2009 this responsibility was transferred to the Ministry of Citizen Protection, based on national, Community and international legislation.

In case of infringement, administrative penalties are imposed (fine, temporary or permanent withdrawal of vessel and captain fishing license, seizure of illegal gears, means and also fish catches).

The application of new technologies, the information technology networks, the new control systems adjusted to the Community provision requirements, and the continuous training of control bodies support efforts to combat illegal fisheries.

The total number of registered infringements for which administrative penalties were imposed is:

- 2008: 1 532 infringements, fines amounting to EUR 1.016 million.
- 2007: 1 249 infringements, fines amounting to EUR 674 370.

Aquaculture

Aquaculture is a significant sector in Greece that contributes more than half of the total fisheries production. In 2008, aquaculture produced 114 572 tonnes corresponding to EUR 376 million. About 70% of this production and 90% of the value comes from marine finfish aquaculture. The proportion of shellfish products corresponds to 25%. Sea bream and

sea bass are the main species farmed in Greece, although tuna fattening is also increasing significantly. Another 910 tonnes of fish, corresponding to around EUR 5 million, was derived from production in lagoons.

Significant aquaculture development has resulted in remarkable results not only regarding the production of domestic fresh, cheap and high quality fish (especially sea bass and gilthead sea bream), but also the creation of a socio-economic structure that directly and indirectly involves thousands of employees, particularly in the fisheries-dependent areas of the country. In addition, mariculture is the only productive activity that has colonised uninhabited islands and rock-islands which are normally excluded from other investments.

Greek policy in the aquaculture sector aims to increase the supply of products with high nutritional value and quality at satisfactory prices; improve production conditions while decreasing production costs; ensure rational fishing management of inland waters; reduce fish imports and increase exports; increase the number of employment opportunities and working conditions especially on small islands and in poor regions as well as equality between men and women; differentiate fishery production by adopting new technologies in the culture of aquatic species; adopt measures for environmental protection; and improve competitiveness as well as the commercial and administrative organisation of aquaculture companies by introducing new technologies and better terms in co-operation among companies.

Production facilities, volumes and values

In 2008, the total number of aquaculture farms reached 1 086 units. The number of mariculture hatcheries and farms was 370. The production systems are mainly open water containment systems (cages) and the main species produced are Gilthead seabream (57%) and Seabass (38%). New species like Common seabream, Sharpsnout seabream, White seabream, Red porgy and Common dentex are beginning to make their way into the industry.

The marine aquaculture sector also includes shellfish-farms (604 in 2008), mainly located in the Northern part of Greece. Freshwater aquaculture includes 110 farms producing rainbow trout (85 farms), salmon, eel and carp. Recent business activity, has led to remarkable investments in infrastructure, technology and knowledge, and to high economical profits through exports of the products.

One bluefin tuna fattening farm was operative in 2008 and 2009, caging 407 tonnes and 604 tonnes respectively. This same farm harvested 487 tonnes and 614 tonnes in 2008 and 2009 respectively. A second bluefin tuna farm registered in ICCAT remained temporarily inactive in 2008 and 2009.

Government financial transfers

In the period 2008-09 and within the framework of the Operational Fisheries Programme 2000-06, financing by the European Financial Instrument for Fisheries Guidance and national support allowed for the implementation of several measures and actions concerning:

- the adaptation of the fishing effort;
- the modernisation of fishing vessels;
- accompanying measures of socio-economic character;
- appropriate measures for the support and enforcement of the small scale coastal fishing; and
- new technologies.

Other projects include the construction, extension and improvement (modernisation) of fishing ports, especially in remote insular groups and in areas directly dependent on fisheries.

With respect to aquaculture, the Ministry of Rural Development and Food (MRDF) – General Directorate for Fisheries implemented projects for the development and management of the aquaculture sector within the framework of the Common Fisheries Policy (CFP) of the European Union. These projects were financed by the European Union and national funds through the Community Support Framework within the framework of the EC Regulation 2792/99 and the Operational Programme for Fisheries drawn up by Greece.

Markets and trade

Landings in volume and value during the period 2008-09 are shown in Table 12.2.

Table 12.2. **Landings in volume and value, 2008-09**

	Landings (tonnes)	Value (EUR '000)
2008	86 105	299 106
2009	81 530	319 061

The main species caught were small pelagic fish (anchovy, sardine), bogue, hake, picarel and chub mackerel. These quantities were landed by fishing vessels that are equipped with a machine having motor power in excess of 19 HP.

During the last two-year period, which coincided with the completion of the Operational Programme for Fisheries 2000-06 (Third Community Support Framework), the establishment and modernisation of processing units of fishing products was greatly supported. These units include packing of fresh fish (mainly sea bass and sea bream), shellfish processing plants, and especially freezing chambers and centres for distribution and marketing.

All processing units were funded only if they had installed self-monitoring system (HACCP) and possessed certifications according to ISO standards. In the evaluation stage (before funding) priority was given to projects which contributed to improved economic fundamentals. At the same time, sufficient guarantees of technical and financial viability were in place and possible adverse effects like surplus production capacity should be minimised.

As regards the marketing of fishery products across the country, the marketing standards of European Community are followed. The legal basis of these standards is the Regulation (EC) No. 104/2000 on the Common Market Organisation for fisheries products. Fishery products are sold to consumers by highlighting the freshness, quality, the name of the product in Greek and Latin, the production method (fishery, aquaculture, inland waters), and location of fishery.

However, the continuing decline in catches from the fishing industry due to the collapse of many fish stocks has led European Union to adopt regulations that arrange the first sale of fishing products, namely the Regulation (EC) 1077/2008 on electronic recording and reporting of fishing activities.

An effort to promote fishing products began in March 2007. It published leaflets with useful information for consumers on sea bass and sea bream and a budget of about EUR 3 million. It included advertisements for television, radio stations and regional

Table 12.3. **Quantities and values (imports, exports) of fishing products for human consumption, 2008-09**

	Imports		Exports	
	Quantity (tonnes)	Value (EUR '000)	Quantity (tonnes)	Value (EUR '000)
2008	128 913.6	431 841.3	123 682.2	448 613.1
2009	154 135.8	431 590.8	129 524.9	477 221.7

newspapers. There were also participation at food and beverage fairs, and guidance was given to people who produce and sell aquaculture species in order to attract consumer interest.

A second project by the Consumer Institute, a non-governmental organisation (NGO) consisted of information meetings held in various regions, as well as the production and broadcasting of television and radio messages. This programme aimed to inform consumer about the prevailing national and local names of fish and fish products.

Both promotional projects were completed in December 2009 and were co-financed by the European Union.

For aquaculture products, Greece's main export market is other EU countries, with over half of production of fish and shellfish species directed to Italy, Spain, the United Kingdom and Germany.

PART III

Chapter 13

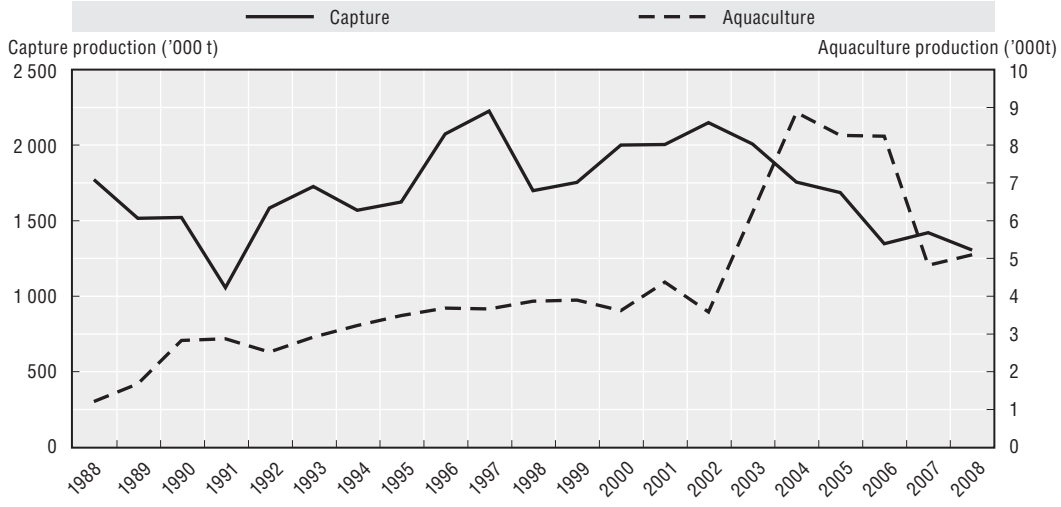
Iceland

Iceland

Summary of recent developments

- There has been a longstanding conflict in the Icelandic fisheries management system over the distribution rent and the perceived negative influence on various regions. Nevertheless, this conflict has has in many ways secured sustainability in the management of living marine resources. The government is reviewing the fisheries management system to address these factors. A working group was created in 2009 and it submitted its conclusions in 2010. The first proposals are to be submitted in 2011. A coastal fisheries option was initiated in 2008 to address amongst other things, the negative influences on regional settlements. This option is to be implemented for May-June with a common pool quota.
- Total Icelandic fish, shellfish and crustaceans catches in 2009 were 1 121 000 tonnes. The total value of landed catches amounted to around ISK 115 billion in 2009.
- The value of exported marine products in 2009 is an estimated ISK 208 billion. Export of fish products was slightly over 40% of total exports of goods, and around 26% of export of goods and services in 2009. The combined share of fisheries and fish processing in GDP was about 7.8% in 2008.

Harvesting and aquaculture production (tonnes)

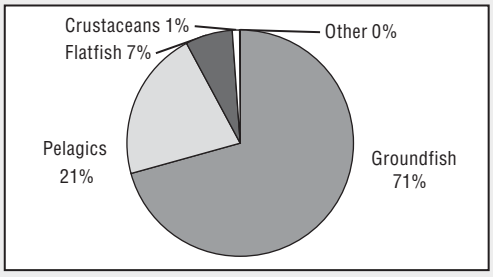


Source: FAO FishStat Database.

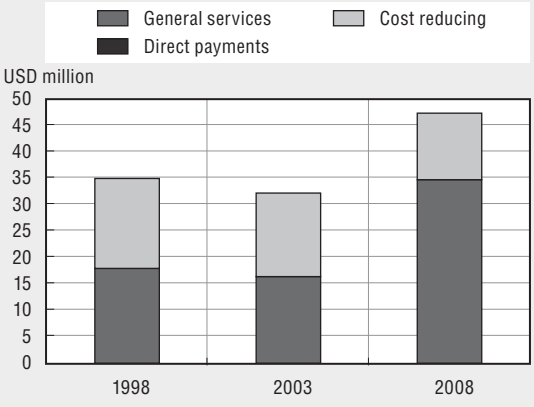
Key characteristics of the sector

- The value of groundfish at 71% is higher than that of pelagic, even though the total volume of pelagic landings far exceeds groundfish in volume. Groundfish is mostly sold fresh, frozen or salted, but a large share of the pelagic catch is used for fish meal or oil processing.
- The fish processing sector receives no direct financial transfers. The value of government financial transfer to the fisheries in 2008 increased 46.8% compared to 2003. General services contribute 73.4% of government financial transfers.
- Iceland is a net exporter on the world fish market and the Icelandic economy is heavily dependent on fisheries exports. In 2009, these exports amounted to 41% of exports of goods, and around 26% of exports of goods and services.
- The main export markets are found in the EES area. There has been a gradual shift over the past decades from frozen and dried/salted fish products towards fresh fish exports.
- Since 2000, there has been more than a 30% decrease in the number of fishermen and vessels. The fleet does not receive government subsidies through decommissioning schemes or fuel subsidies. The fisheries management system aims to control catches, but not the fleet directly. It is clear that the ITQ system has indirectly contributed to the control of capacity. In contrast, net profits of the fishing and fish processing industries have been increasing since 1997.

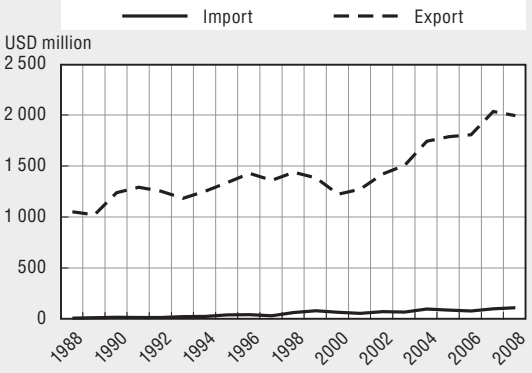
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	6 100	4 200	–31.1
Number of fish farmers	100	n.a.	n.a.
Total number of vessels	1 740	1 166	–33.0
Total tonnage of fleets	173 953	146 614	–15.7

n.a.: not available.

Legal and institutional framework

Current framework

The Fisheries Management Act of 1990 is the main framework of the present fisheries management system, which has undergone a series of subsequent adjustments. The Act provides for a system of individual transferable quotas (ITQs) in all commercially important stocks that are allocated to individual fishing vessels. The fishing year begins on 1 September and concludes on 31 August of the following year. The Minister of Fisheries determines the total allowable catch (TAC) for individual species annually on the basis of scientific advice from the Icelandic Marine Research Institute (MRI). The size of each vessel's annual catch quota in a specific fishery is a simple multiple of the TAC for that fishery and the vessel's quota-share. Thus, the annual vessel catch quota is denominated in volume terms. Both the permanent quota-shares and the annual catch quotas are transferable, subject to certain restrictions, and perfectly divisible. This means that any fraction of a given quota may be transferred. Some 98% of catch landed is subject to TACs.

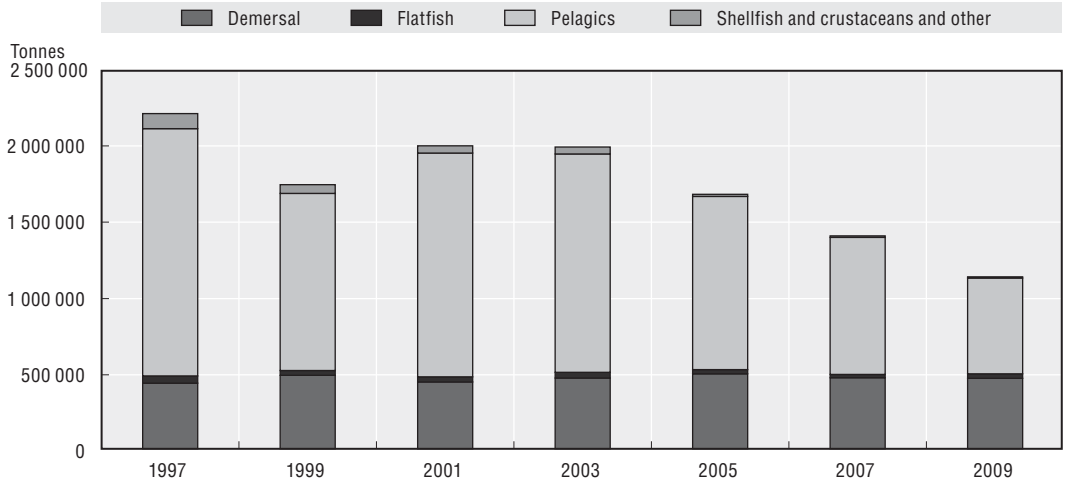
In addition to the ITQ system, Icelandic fisheries are subject to many other management measures such as area restrictions and fishing gear restrictions. Extensive closing of fishing areas are used to conserve important vulnerable habitats as well as provisions for temporary closures of to protect spawning fish as well as real time closures, *i.e.* instant short term closures to protect juveniles.

Capture fisheries

Landings, quantity and value

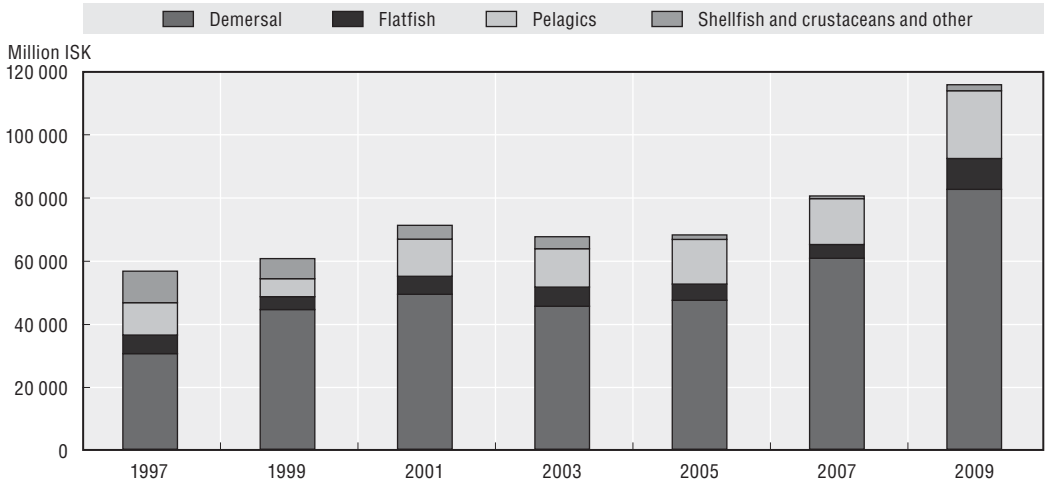
Icelandic catches from all fishing grounds in 2009 amounted to 1 121 000 tonnes, a slight decrease from the last years. The demersal catches remain fairly stable between years, usually between 450-500 000 tonnes but the pelagic catches vary considerably. The highest catch year was 1997 when total Icelandic catches reached 2 200 thousand tonnes with the total pelagic catches around 1 613 thousand tonnes, mostly capelin. Of the demersal species, cod contributes to around 40% of the volume.

Figure 13.1. **Iceland catches, 1997-2009**



The total first-hand value of the Icelandic catch in 2009 amounted to ISK 115 billion, and increased from 99 billion in 2008. Since the Icelandic krona depreciated considerably from its former high in 2007 this was to be expected as over 97% of the fish is exported, either unprocessed or processed. When it comes to value the demersal catches overshadow the larger volume of the pelagic ones. The demersal landings value is around 70% of the total and the pelagic landings under 20%, even if the total volume of pelagic landings exceeds the demersal catch volume. This reflects the extensive use of the demersal species for processing. The demersal catch is mostly sold fresh, frozen or salted, but a large share of the pelagic catch is used for fish meal or oil processing.

Figure 13.2. **Catch value of Icelandic vessels, 1997-2009 (in current prices)**



The fishing fleet

The current fishing fleet consists of several vessel types. Statistics Iceland divides the fleet into three main categories; trawlers that are relatively large fishing vessels engaged mainly in demersal fisheries; decked vessels are different types of vessels in a wide size range; and undecked, small vessels which includes numerous vessels of sizes up to 10 GT although most of them are less than 6 GT. Most of those boats are technologically advanced.

The past years have seen a slight and gradual decrease in the number and GT of the Icelandic fleet. The fleet does not receive government subsidies through decommissioning schemes or fuel subsidies. The fisheries management system aims at controlling catches, but not fleet directly. It is certain that the ITQ system has contributed indirectly to controlling the capacity.

Financial performance

Net profits of the demersal fleet, calculated using an annuity approach using a 6% rate of return, have been increasing from 1997, which was the last year with negative profits. In 2009, the profits of the demersal fleet in total amounted to 18.3%.

Employment and percentage of GDP

In 2009, around 4 400 people were employed in the fisheries sector, or about 2.6% of the estimated workforce. The percentage of people working in the fisheries sector is higher

Figure 13.3. **Total GT of the Icelandic fishing fleet by type of vessel 1999-2009 (end of year)**

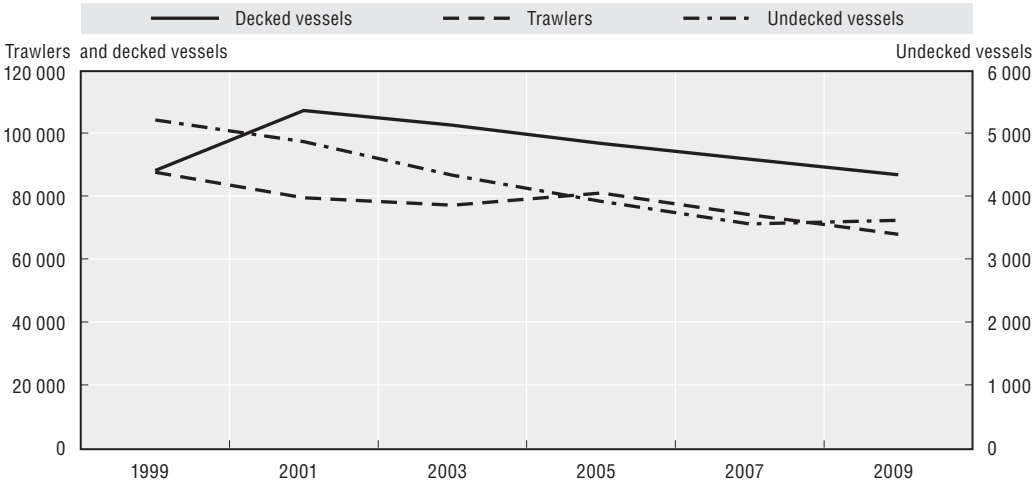
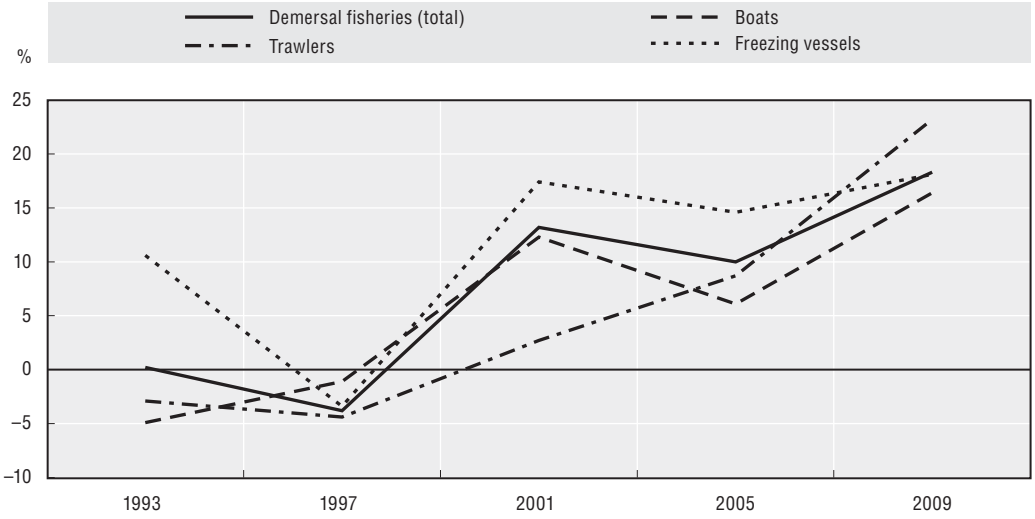


Figure 13.4. **Net profits in demersal fishing, using an annuity approach with 6% rate of return**



outside the capital area, and the sector is male dominated with only around 10% female participation. The fisheries sector accounted for 6.3% of GDP in 2009.

Status of fish stocks

Cod: The spawning stock biomass has been relatively low during the last 35 years. It reached an historical low in 1993, around 120 000 tonnes, but has since increased and is currently estimated to be about 300 000 tonnes. The 2001-07 year classes are estimated to be below average. The first estimates of the 2008 and 2009 year class indicate that the spawning stock may be close to the long term average. The exploitation rate has decreased significantly from about 40% in 2000 to approximately 22% in 2009. Fishing mortality has declined at the same time from 0.7 to 0.4. Fishing mortality is estimated to be lower in 2010. This spring the Government of Iceland adopted a management plan for the Icelandic cod stock to be implemented during the next five fishing years. ICES has

evaluated the plan and concluded that it conformed to international agreements on precautionary approach to fisheries management and MSY.

Haddock: The biomass of age three and older haddock is estimated to be 173 000 tonnes at the beginning of 2010. The mean fishing mortality is estimated 0.52 in 2009 and 0.35 in 2010. Short- and medium-term predictions show that the stock size of haddock will decrease in coming years when the very large 2003-year class disappears from the stock and small- to medium-size year classes replace it.

Saithe: The spawning stock biomass at the beginning of 2010 is estimated to be 89 000 tonnes and fishing mortality in 2009 is estimated at 0.47, well above the target of 0.3. In early 2010, ICES hosted a meeting where a benchmark assessment of the Icelandic saithe stock took place. The results of the meeting were that the assessment method was changed and a harvest control rule (HCR) was suggested and tested. F_{msy} for the stock is now estimated at 0.28.

Golden redfish: Fishing effort has remained relatively stable at low levels in recent years. CPUE decreased from 2004 to 2006 after an increase to a record high level in 2004 and has since then been relatively stable. Survey indices of the fishable part of the stock declined to a record low level in the mid 1990s, but have since then increased to about 60%. There are indications from the autumn survey that year classes 1996-99 are above average in size.

Summer-spawning herring: The spawning stock is estimated at 246 000 tonnes in the beginning of the fishing season in 2010-11. In 2009, the stock was heavily infected by *Ichthyophonus* parasite for the second year in a row. It is estimated that roughly 40% of the stock has died because of this infection. The status of the infection will be assessed with a survey in July 2010 and again early next autumn.

Norwegian spring spawning herring: ICES recommended a TAC of 1 483 000 tonnes for the 2010 season, corresponding to F = 0.125. According to the international agreement reached in January 2007, Iceland will have a quota of 215 000 tonnes in 2010. ICES will not recommend a TAC for 2011 until Autumn 2010.

Capelin: The fishable capelin stock has been at a low level during the last five seasons. The results of the 2009 autumn surveys do not justify an allocation of quota. The MRI advises that a fishery is not opened unless further acoustic surveys confirm sufficient abundance of these cohorts to sustain a fishery with the usual prerequisite of a target remaining spawning stock of 400 000 tonnes in Spring 2011.

Management of commercial fisheries

Revision of the Icelandic fisheries management system: There has been a longstanding debate in Iceland around the fisheries management system. This should be viewed in context to the economic importance of the fisheries sector in Iceland. When the present management system was first initiated in 1984 the Icelandic fisheries sector was in dire straits. The most important fish stock, cod had been in steep decline for some time and the sector itself was running heavily in the "red", *i.e.* generating negative resource rents. There have been several "overhauls" of the system since then, but generally towards consolidating the ITQ system by adding species and vessel classes into the system. It can be stated that the system has been successful in securing the biological conservation of the major fish stocks as well as the financial health of the sector. In the language of sustainable development it can be said that the fisheries management system has been successful in guaranteeing the biological and economical sustainable management of the fisheries

resources. The third component of the sustainable platform, *i.e.* the socially sustainable factor is the one that the debate revolves around. Another formulation would be that the dispute is on the division of the resource rent that the system has generated, which can be considered an enviable position compared to the resource rent dissipation in many of the world's fisheries, stated in recent publications.

The government coalition platform (*http://eng.forsaetisraduneyti.is/news-and-articles/nr/3706*) states that the fisheries management legislation shall be reviewed with the aim of amongst other: "… reinforcing regional settlement"; "resolving the conflicts among Icelanders on ownership and utilisation of the marine resources".

The review of the fisheries management system and the legislation is intended to be carried out in consultation with fisheries stakeholders and a working group was appointed in 2009 to work on the review and invited stakeholders and experts to participate. The group submitted its conclusions in September 2010 (*www.sjavarutvegsraduneyti.is/frettir/frettatilkynningar/nr/10194*). It is expected that the work of the committee will be used as the basis for the proposed revision. The first proposals are expected in 2011.

Coastal fisheries: With a stated aim of, amongst others, reinforcing regional settlement, a coastal fisheries option was initiated within the fisheries management system in 2008 and has now been in operation for three years. The coastal fisheries are seasonal and take place in the summer months May-June with a common pool quota. The total pool quota is allocated for each month per four geographical regions. As soon as the quota for a particular region is exhausted the fisheries are closed for the month. The vessels that can apply for coastal licences are small vessels using hand line only and they are not allowed to fish in other parts of the management system during the coastal operational season. Vessels shall only participate in fisheries in their home region. In addition there are restrictions on the time length of each fishing operations, each fishing trip shall not to exceed 14 hours and only one trip is permitted per day, five days per week. Maximum allowable catch per fishing trip is 800 kg per vessel.

In 2009, it was estimated that over 500 small boats fished around 3 400 tonnes, mostly cod and landed in 54 ports. The value of landed catches amounted to around ISK 850 million.

Fishing fee: Starting from 2004, the fishing sector pays a special fishing fee, calculated from aggregate profits of the sector and the quota allocation of each company. In 2009-10, the percentage was 9.5% of the calculated profit.

Investment in the fishing industry: Direct foreign investment in companies engaged in fishing within the Icelandic territorial waters is restricted. Under certain conditions indirect foreign investment is allowed. The same applies for foreign investment in primary fish processing, excluding retail packaging and later stages of preparation of fish products for distribution and consumption. No vessel owned or operated by a foreign party may engage in fishing or fish processing in Icelandic waters, apart from those authorised under bilateral fishing agreements.

Multilateral agreements and arrangements

Iceland is a member of NEAFC, NAFO, ICCAT and NAMMCO. In 2009, Iceland signed the FAO Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing and is in the process of ratifying the Agreement.

Monitoring and enforcement

The Directorate of Fisheries is the enforcement agency of the Icelandic fisheries. Iceland has one of the most extensive enforcement regimes in the world, in particular regarding port control and weighing of all catches. According to Icelandic law, discards are prohibited. All catches by Icelandic vessels must be weighed and recorded at the port of landing by the local port authorities. The ports of landing are then required to send information on a daily basis directly to the Directorate of Fisheries database. This means the Directorate always has up-to-date figures on catches and can conduct its management and surveillance of fisheries promptly and effectively. The information is publicly available on internet, which ensures transparency.

Government financial transfers

The capture fisheries sector does not receive any direct financial transfers such as trough decommissioning schemes. As for fuel subsidies, effective from 2010 the fishing sector is subject to a carbon tax, and is only allowed concessions from a road levy imposed for vehicles using the road system. A special income tax concession for crew members is being faced out. The processing and post-harvest sector in general does not receive direct financial transfers either.

Post-harvesting policies and practices

Information and labelling

An Icelandic Responsible Fisheries Management labelling (RFM) scheme has been some time in preparation. The Fisheries Association of Iceland is facilitating the Icelandic RFM programme and all stakeholders of Iceland's seafood industry are participating. The certification programme complies with the strictest international standards. It is based on the articles and minimum substantive criteria described in the *FAO Code of Conduct for Responsible Fisheries* and *FAO Guidelines for the Eco-labelling of Fish and Fishery Products*. These documents have been translated into a straightforward assessment *specification* by the Icelandic Technical Committee and incorporated in an ISO 65-based certification programme. *Global Trust Certification Ltd*. will independently manage the certification and assessment methodology that is used to assess and certify Icelandic fisheries against the Icelandic specification. The Icelandic Specification and Certification methodology is accredited by an IAF Accreditation Body (a member of the *International Accreditation Forum*) to the international standard for certification EN45011/ISO 65.The first certified species in the programme was cod, effective in 2010.

Foreign investment in the processing industry

Direct foreign investment in companies engaged in primary fish processing is restricted. Under certain conditions indirect foreign investment is allowed. This is excluding retail packaging and later stages of preparation of fish products for distribution and consumption. No foreign ownership limitations apply to fish processing beyond the stage of primary processing.

Financial performance

Net profits of the fishing and fish processing industries have been increasing from 1997, which was the last year with negative profits. The combined net profits from

fishing and fish processing as percentage of revenue were 22% in 2009 and had been steadily increasing from 2004, when the figure was 5.9%. From 2007, the sectors have benefitted from the devaluation of the Icelandic currency, even though foreign currency loans of companies have increased because of the exchange rate.

Government financial transfers

The fish processing sector does not receive any direct financial transfers. The Ministry of Fisheries and Agriculture has organised and financed short training courses for foreign fish processing workers, amounting to around ISK 8-10 billion per year.

Employment and percentage of GDP

In 2009, around 3 500 people were employed in the fisheries processing sector, or 2.1% of the estimated workforce. The percentage is higher outside the capital and, unlike the fishing sector, the gender ratio is more evenly distributed, the male vs. female ratio being 60:40.

In 2008, which is the latest available figure, the fish processing sector accounted for 3% of GDP.

Markets and trade

The Icelandic economy is heavily dependent on fisheries exports and in 2009 these exports amounted to 41% of exports of goods, and around 26% of exports of goods and services. It is estimated that over 97% of the fish production is exported. The main export markets are the EES area with nearly 79% of total export value. The EES market has been growing over the last decades. This can be attributed to increased exports to individual countries within the area, but also to the growing number of countries entering the EES. There has been a gradual shift from frozen and dried/salted fish products towards fresh fish exports the past decades. The total fisheries product export value was ISK 208 billion in 2009, the single most valuable species being cod, which amounted to ISK 75.5 billion, or 36% thereof.

PART III

Chapter 14

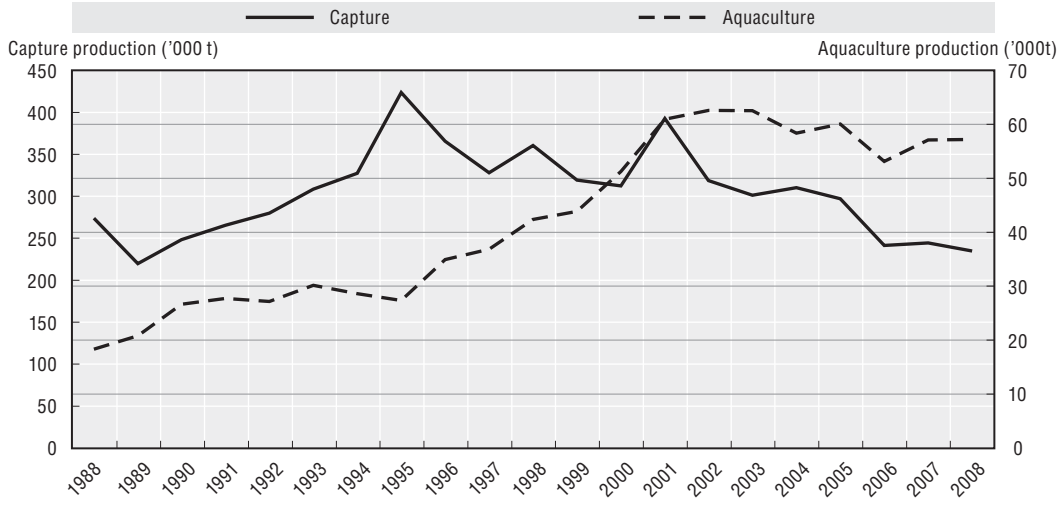
Ireland

Ireland

Summary of recent developments

- In 2008, landings of fish by Irish registered vessels totalled *circa* 201 932 tonnes with a total value of EUR 188.3 million. In 2009, the total volume was 227 324 tonnes with a corresponding value of EUR 181.6 million.
- Aquaculture production increased from 44 869 tonnes in 2008 to 47 212 tonnes in 2009 while the corresponding values also increased from EUR 92.7 million (2008) to EUR 104.7 million (2009).
- Over the period 2008-10, there has been further consolidation in the processing sector, with an increasing focus on value-adding and maximising returns on limited raw fish material. The catching sector has focused on increasing quality, on board processing in tandem with delivering certified responsible fishing practises.
- In 2010, Irish seafood exports were valued at almost EUR 374 million and amounted to just over 274 818 tonnes. This represents an overall increase of almost 13% in value from EUR 332 million achieved in 2009 and a 29% increase in volume, in keeping with general Irish food export trends in 2010.
- The need to ensure sustainable development of fisheries remains the highest priority, with scientific advice remaining pessimistic for many stocks. At the national level, the Seafood Strategy Report was launched in 2007. The need for enhanced and consistent control and monitoring is another high priority for Ireland.

Harvesting and aquaculture production (tonnes)

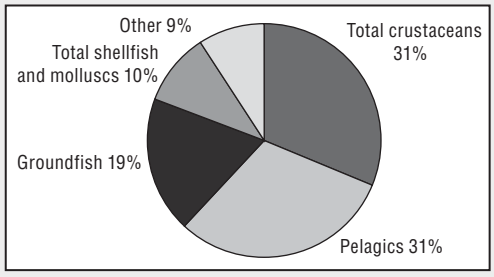


Source: FAO FishStat Database.

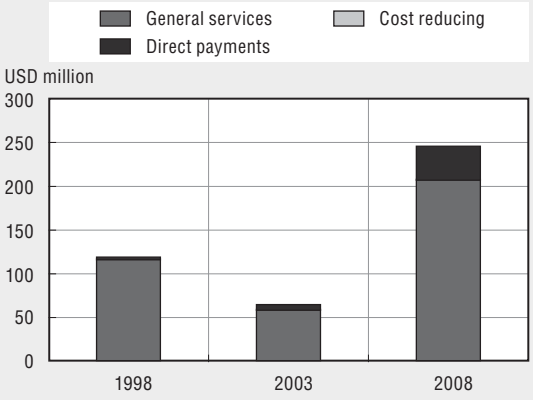
Key characteristics of the sector

- The most important species landed in 2008 in terms of value were total crustaceans (31%) followed by pelagic fish (31%), groundfish (19%), and shellfish and molluscs (10%).
- A total of USD 245 million was transferred to the Ireland's fisheries sector in 2006, which is a big increase of USD 180 million (277%) compared to USD 65 million in 2004. About 84% of the transfers in 2009 were spent in general services.
- Ireland has had a trade surplus in fisheries products for decades. The total export value of fisheries products was USD 489 million in 2008, being exported mainly to France, Spain, the United Kingdom and Italy. The total import value of fisheries products amounted to USD 235 million in 2008 resulting in trade surplus of USD 254 million.
- The total numbers of fishers and fish farmers have significantly decreased compared to the year 2000. Interestingly; however, the number of vessels increased substantially (68.6%) and the total tonnage of the fleet also increased (13.5%) in the same period.

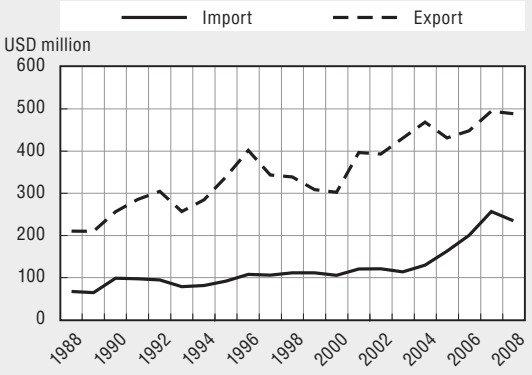
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD million)



Capacity

	2000	2008	% change
Number of fishers	9 842	4 829	–50.9
Number of fish farmers	3 207	1 964	–38.8
Total number of vessels	1 196	2 016	68.6
Total tonnage of fleets	61 451	69 724	13.5

Legal and institutional framework

As a member of the European Union, Ireland implements fisheries policies which are decided at European level in the context of the Common Fisheries Policy (CFP), which was revised in 2002. Within this framework, Ireland implements policy at central government level through the Department of Agriculture, Fisheries and Food (DAFF). The national legal framework comprises the Fisheries Acts, 1959 to 2006. Statutory Instruments are promulgated under this framework for such measures as quota management, fishery closures, licensing regimes, effort control and technical conservation measures. A review of the existing national legislation in this area, undertaken with a view to updating it to ensure Ireland's compliance with the obligations of the CFP, was completed early in 2006 with a new Act, the Sea Fisheries and Maritime Jurisdiction Act 2006, enacted on 4 April 2006. This Act, coupled with a further Act introduced in 2003, has totally updated the national framework for the implementation of sea fisheries law. This modern legal framework ensures Ireland's full and continued compliance with the control obligations of the CFP and allows for the implementation of the CFP. This enactment allows for the introduction of secondary legislation (Statutory Instruments) to bring into force EU and national control and conservation measures. In addition, Fishery Management Notices are also in place to provide for management of Ireland's quota and fishing effort entitlements.

Capture Fisheries

Performance

Table 14.1. **Landings by Irish vessels in volume and value (2008-09)**

	Volume (tonnes)		Value (EUR million)	
	2008	2009	2008	2009
Tuna	1 547	2 050	4.3	9.3
Demersal	19 366	23 523	48.5	45.8
Pelagic	158 413	179 915	57.8	65.8
Shellfish and molluscs	5 216	7 680	18.9	21.3
Crustaceans	17 389	14 157	58.8	39.4
Total	**201 931**	**227 325**	**188.3**	**181.6**

Employment

In total, approximately 11 000 people are employed directly in the sea fishing, aquaculture and support industries.

Status of fish stocks

In terms of waters adjacent to Ireland, stocks in particular difficulty according to scientific advice include cod in Area VIa (which includes waters to the west and north of Ireland) and the Irish sea. These stocks are subject to recovery plans.

Management of commercial fisheries and management instruments

With annual quotas imposed on all the principal species at EU level, the objective of fisheries management is to regulate and maximise the catch, sale and processing of fish within the limits set. Each month, on the basis of national quota allocations, the DAFF,

following consultation with the industry, decides on management regimes for the following month. These management regimes involve catch limits per vessel and are implemented by means of Fishery Management Notices.

Pelagic fisheries

The term "pressure stock" is applied to certain, high demand species. Such species are subject to additional management measures controlling times, areas and weekly or monthly amounts fished. An added stipulation requires early notification of intention to fish. Open and closed seasons are imposed where necessary. At present, the following are considered pressure stocks:

- Western Mackerel – in ICES Divisions VI, VII, VIIIabde; EC waters of Vb; international waters of IIa, XII and XIV.
- North West Herring – in ICES Divisions EC and international waters of Vb and VIb and VIaN, VIa(S)/VIIbc.
- Celtic Sea Herring – in ICES Divisions VIIfghjk.
- Horse Mackerel – in ICES Divisions EC waters of IIa and IV, VI, VII, and VIIIabde; EC waters of Vb; international waters of XII and XIV.

In addition to requiring sea fishing boat licenses, participants in the above fisheries must hold current authorisations.

Pelagic Management Advisory Committees are in operation in the following areas:

- Celtic Sea Herring Management Advisory Committee.

Demersal fisheries

Key whitefish stocks of importance to Ireland are managed monthly. A whitefish quota management committee, comprising of members of the industry and national administration officials, meets monthly to undertake detailed analysis of key stocks including Cod, Haddock, Whiting, Hake, Monk, Megrim, Nephrops, Sole and Plaice, as well as deep sea species (see below). The majority of quota fisheries are controlled by means of separate Fishery Management Orders made by the Minister which restrict the fisheries as necessary, by setting catch limits per boat, according to the size of the vessel based on recommendations of the committee. The principal objective is to maintain access on an equitable basis throughout the year. Practical implementation of management regimes falls to Sea Fisheries Protection Officers on land and the Naval Service at sea.

Deep water species

Total allowable catches (TACs) for deep water species were adopted for the first time in 2002 (fixing quotas for 2003 and 2004). In November 2008, Total Allowable Catches were fixed for the years 2009 and 2010. Quotas for the following stocks were available in 2009 and 2010:

- Black Scabbardfish – in ICES Divisions V, VI, VII, XII (EC Waters).
- Greater silver smelt – in ICES Divisions III, IV, V, VI, VII (EC Waters).
- Tusk – in ICES Divisions V, VI, VII (EC Waters).
- Roundnose grenadier – in ICES Divisions Vb, VI, VII, VIII, IX, X, XII, XIV (EC Waters).
- Blue ling – in ICES Divisions II, IV, V, VI, VII (EC Waters).

- Ling – in ICES Divisions VI, VII, VIII, IX, X, XII, XIV (EC Waters).
- Red seabream – in ICES Divisions VI, VII, VIII (EC Waters).
- Alfonsinos – in ICES Divisions III, IV, V, VI, VII, VIII, IX, X, XII, XIV (EC Waters).
- Deep sea sharks – in ICES Divisions V, VI, VII, VIII, IX, XII (EC Waters).
- Forkbeards – in ICES Divisions V, VI, VII (EC Waters).

Under the EU Regulation adopted in 2002, and implemented at national level by Statutory Instrument, participants in this fishery are required to hold a permit (fishing authorisation), which is granted to an applicant who has met criteria as laid down in the Statutory Instrument.

Participants in this fishery are then issued with monthly notifications advising them of catch restriction limits. These monthly limits are set following consultation with the industry and take into account the uptake to date of the available quota.

Access to waters outside the European Union

Ireland participates in the "northern" pelagic agreements which the European Union negotiates with Norway, the Faroe Islands, Iceland and Greenland, with particular interest in mackerel, herring (Atlanto-Scandean), horse mackerel and blue whiting. It also participates in the albacore tuna fishery (Atlantic Ocean north of 5° North) regulated by ICCAT. There are few vessels which partake in more distant water fisheries.

Participation by foreign (EU and non-EU) vessels in Irish waters is governed at EU level under the CFP. However, the control and monitoring of this is enforced by the Irish authorities.

Management of recreational and inland fisheries

The Department of Communications, Energy and Natural Resources, Inland Fisheries Division, has overall policy responsibility for ensuring the effective conservation of inland fish habitats and stocks and facilitation of the exploitation of the resource on an equitable and sustainable basis. The Central Fisheries Board is responsible for policy advice, administration of national and EU funding programmes, promotion and marketing of angling, management of fish rearing operations and co-ordination of the work of the seven Regional Fisheries Boards. The Regional Fisheries Boards are themselves responsible for conservation, management, promotion and development of the fisheries and ensuring compliance with environmental legislation such as the EU Habitats and Water Framework Directives. The responsibilities of the boards also extend to coastal waters within the 12-mile limit. Finally, the Loughs Agency is an agency of the Foyle, Carlingford and Irish Lights Commission established under the British-Irish Agreement Act 1999 to provide the effective conservation, management, promotion and development of the fisheries and marine resources of the Foyle and Carlingford areas.

Salmon management and alignment with scientific advice

International best practice for the management of North Atlantic Salmon requires the adoption of the precautionary approach and the cessation of indiscriminate mixed stock fisheries. These are the recommendations of the International Council for the Exploitation of the Sea and the North Atlantic Salmon Conservation Organisation (NASCO). In 2006, the Government reaffirmed its commitment to manage the wild salmon fishery in line with the scientific advice from 2007 onwards in the interests of conservation of wild stocks and

the following year essentially closed the Irish mixed stock salmon fishery (principally drift nets and some coastal draft nets).

Under the Fisheries Acts, a suite of Regulations and Conservation Bye-Laws are in place to protect species such as salmon and sea trout. The principal conservation measures are enshrined in the Wild Salmon and Sea Trout Tagging Scheme Regulations, which are revised on an annual basis and provide for the introduction of salmon conservation measures. Since 2007, the harvest of salmon, by commercial and recreational (angling) means, has been restricted to those stocks of rivers that are meeting their conservation limits.

Recognising that compliance with scientific advice would mean hardship for commercial fishermen and vulnerable coastal communities, the Government introduced a hardship scheme for the fishermen affected by the decision to move to single stock salmon fishing. A fund of EUR 30 million was allocated for the purpose and 1 171 former licence holders received payments aligned with the previous catch history on the basis that they undertook not to engage in the fishery in future.

The policy of aligning with scientific advice has delivered significant overall catch reductions, aimed at achieving the government's prime objective of restoration of wild salmon stocks. The total catch and total allowable catch for each of the years since 2004 is set out in Table 14.2:

Table 14.2. **Salmon catches 2004-09**

	TAC number of salmon	Commercial catch	Angling	**Total catch**
2004	161 951	143 606	26 202	**169 808**
2005	139 900	121 180	22 361	**143 541**
2006	91 367	86 176	22 485	**108 661**
2007	64 011	8 843	19 430	**28 273**
2008	81 766	8 903	22 215	**31 118**
2009	75 539	6 757	17 521	**24 278**

According to catch statistics the total number of salmon, taken by all methods of fishing has dropped by 91% from 259 475 in 2001 to 24 278 in 2009. In 2008, the *ad hoc* Review Group established by NASCO to review salmon management congratulated Ireland on the major improvements in recent years in the management of its salmon fisheries.

Marine survival

Following the prohibition on mixed stock fishing the Standing Scientific Committee noted that as anticipated in 2007 all salmon indices (including counters) went up significantly. This increase would roughly equate to the reduction in exploitation as a result of the closure of the mixed stock fishery. In 2008 and 2009, many of these indices were down with some significant drops, despite the continued closure of the mixed stock fishery at sea. They cautioned that it was likely that this reflected the persistent downward trend in marine survival which is pervasive throughout all the North Atlantic stock complexes and is as reported by the International Council for the Exploration of the Sea. The most recent information from stock monitoring indicates that many of the indices recovered somewhat and increased in 2010 and estimates of marine survival also increased generally. However, these marine survival estimates are still amongst the lowest

in the time series since records began in the 1980s for Irish populations of Atlantic salmon and other North Atlantic stocks.

Coarse fishing

In 2006, the government introduced conservation Bye-Laws limiting the catch of coarse fish by recreational anglers.

EU eel regulation

The European Union brought forward Council Regulation 1100/2007 the purpose of which is the establishment of a new framework for the protection and sustainable use of the stock of European eel. The objective of the Regulation is to achieve recovery of the stock to previous high levels. Conservation by-laws were introduced in May 2008 as a step towards the conservation measures necessary. These capped the number of licences and restricted the season. In addition, a draft Eel Management Plan (EMP) was prepared and submitted to the EU Commission in accordance with the Regulation.

Restructuring

Late in 2008, the Government announced its intention to rationalise a number of State Agencies and this included the establishment of a single National Inland Fisheries Board which will subsume the functions of the existing Central and Regional Fisheries Boards.

Aquaculture

Table 14.3. **Total aquaculture production (volume and value) 2008 and 2009**

Species	Volume (tonnes)		Value (EUR million)	
	2008	2009	2008	2009
Rope mussel	10 067	8 981	6 418	4 713
Bottom mussel	16 993	17 521	17 294	13 213
Gigas oyster	6 188	6 488	12 469	13 685
Native oyster	389	358	1 322	1 454
Clam	187	162	1 189	1 093
Scallop	59	55	339	386
Shellfish other	4	0.28	156	29
Total shellfish	**33 887**	**33 565**	**39 187**	**34 573**
Salmon ova/smolt[1]	136	197	1 151	1 874
Salmon	9 217	12 210	47 117	65 368
Sea reared trout	930	478	3 675	1 667
Freshwater trout	799	896	2 223	2 579
Other finfish	36	62	538	505
Total finfish	**11 118**	**13 843**	**54 704**	**71 993**
Brown seaweed	3	0	0	0
Total aquaculture	**45 008**	**47 408**	**93 891**	**106 566**

1.

In 2009, there were a total of 1 952 people employed in the aquaculture industry, of which 614 were in full-time employment, 418 were in part-time employment and 920 were employed on a casual basis. There was a slight fall of 0.6% in overall aquaculture employment in 2009.

Table 14.4. **Employment (2009)**

Species	Maximum employment
Abalone	13
Arctic charr	4
Bottom mussel	209
Clam	45
Freshwater trout	19
Gigas oyster	462
Turbot	4
Native oyster	619
Perch	12
Rope mussel	246
Salmon	144
Scallop	109
Sea-reared trout	12
Smolt	49
Brown seaweed	3
Urchin	2

Fisheries and the environment

Preparation of a new National Biodiversity Action Plan was commenced by the Department of the Environment, Heritage and Local Government in 2008. It is expected that the new plan will encompass measures to reduce adverse effects of marine fisheries and aquaculture on biodiversity.

In July 2003, ECOPACT, an Environmental Code of Practice for Aquaculture Companies and Traders, was launched and is an initiative designed to bring Environmental Management Systems (EMS) into the Irish aquaculture industry. The adoption of a formal system of environmental management by an aquaculture company represents a strong commitment to environmentally sustainable operations to a standard beyond legislative compliance in Ireland.

The ECOPACT initiative has transformed the way in which aquaculture operators manage the environment, and demonstrate its priority across all aspects of their day to day business. The unique flexibility of ECOPACT means that the 80 plus scheme members have embraced the initiative and continue to use it at a variety of levels from the production of a simple environmental policy which demonstrates their production ethos to potential customers, to using the programme as a stepping stone to achieving certification to independently accredited and internationally recognised eco, organic and sustainability standards. The ECOPACT manual itself provides the foundation for environmental management training on fish farms across the country and remains a valuable reference document especially in relation to protected species and habitats under the Natura 2000 framework.

The Irish Quality Eco- and Organic-Standards for mussels and salmon have been developed in the basis of ECOPACT and using this to establish an environmental standard tailored to salmon and mussel production. The Irish Quality Eco-Standard follows the FAO guidelines for eco-labelling marine fishery products for sustainable use of resources, sound management practices and consideration to ecosystem impact and is accredited to ISO65/EN45011, the internationally recognised “gold standard” for product certification.

The Irish Quality Mussel Eco-Standard was a prominent reference in the WWF global Aquaculture dialogues for the production of an international bivalve eco-standard. The

Organic standards conform with European legislation for the production of Organic Aquaculture products meaning that products certified to the standard can also carry the EU organic logo. Work is ongoing to obtain recognised equivalence of the Irish Quality Eco-Standards with other internationally prominent standards.

Government financial transfers

For the two years under review, the following direct payments (capital grants) were made to the sector.

Table 14.5. **Government financial transfers**

	Grants paid (EUR million)	
	2008	2009
Fleet and fisheries	25.591	20.463
Aquaculture	2.802	4.327
Processing and marketing	1.39	0.263
Total	**29.702**	**25.053**

Cost-reducing transfers

Other than the application of EU-wide taxation arrangements concerning fuel, cost-reducing transfers are not a feature of the sector.

Social assistance

A social welfare scheme entitled "Fishing Assist" is available for fishermen, which provides a level of assistance in the absence of fishing activity for a minimum specified period.

Structural adjustment

In 2008, a decommissioning scheme for fishing vessels over 18 metres in overall length was introduced. This scheme which was completed in 2009 involved the decommissioning of 46 boats, comprising 6 913 GT and 19 356 kW.

Post-harvesting policies and practices

Policy changes

Food safety

In 2006, the regulatory framework underpinning food safety including seafood safety underwent a fundamental change, with the implementation of a group of EU regulations called the "Hygiene Package" designed to merge, harmonise and simplify the legal basis. In general terms, specific obligations of food business operators regarding necessary standards for placing seafood on the market were not subject to significant alteration by the introduction of this legislation. However, the overarching ethos of the new Hygiene Package included some important shifts in emphasis. One example was applicability for all stages of the food chain from primary producers, such as fishermen or aquaculture producers, right through to retail. A further example is the clear onus of responsibility for safety of food on food business operators, with the role of authorities becoming the verification of compliance.

An underlying tenet of this legislation is a risk-based approach to issues, with proportional responses and flexibility where appropriate. Harmonised interpretation and implementation in seafood sector has been progressed by devising agreed codes of practice, *e.g.* on microbiological classification of shellfish production areas and biotoxin monitoring of shellfish production areas. A specific requirement of this legislation is the need for all food business operators to be registered, and, for some food business operations typically processing, to be approved by the competent authority and these processes have taken place in Ireland.

Information and labelling

Since July 2003, in accordance with the requirements of Council Regulation No. 104/2000 (EC), labelling system giving traceability information in respect of a wide range of seafood and aquaculture products has been in operation in Ireland under the terms of S.I. No. 320 of 2003. In addition to general EU food law, and general labelling regulations, which prohibit the misleading of consumers, these regulations require specific ancillary information to accompany fishery products and be provided to consumers, *e.g.* species name, production type (wild-caught or farmed) and catch area if wild caught. Official controls throughout the sea-food-chain, have continued to verify compliance with these requirements to ensure the provision of accurate information to consumers.

Structures

Effective marketing of fish products continues to receive high priority. A Quality Seafood Programme is in place, which is designed to deliver a more integrated approach along the supply chain. During the period under review, work was also progressed in relation to the development of species-specific supply guides.

Processing and handling facilities

Over the period 2008-10, there has been further consolidation within the processing sector, with an increasing focus on value-adding and maximising returns on limited fish raw material. The catching sector has focused on increasing quality, on board processing in tandem with delivering certified responsible fishing practises.

Markets and trade

Market

Irish seafood trade was valued at EUR 707 million during 2010, made up of domestic market valued at EUR 333 million and exports EUR 374 million.

Domestic market

The domestic market valued at EUR 333 million is made up of trade sales EUR 180 million domestically produced and EUR 153 million imports.

Against a difficult economic background, the retail market declined 11.6% on 2009, due to decline in volume due to fall in trip numbers. Consumers are buying smaller amounts of seafood, less often. Market Value is made up of 42% frozen, 40.7% pre packed and 17.4% loose. Average price per seafood is EUR 11 per kilogram. Pre-packed fresh fish now accounts for 75% of all fresh fish sales with increases in smaller pack sizes. The species which make up the majority of the market are cod, salmon, haddock and prawns.

Promotional efforts

On the home market, BIM continue to work on initiatives which help to enhance marketing effort and expertise within the sector.

To assure consumers that Irish seafood meets the highest standards through every stage of catching and production, BIM has developed the Quality Seafood Programme (QSP).

BIM continued to be active in promotional campaigns and at trade events overseas, in conjunction with other agencies, in the years under review.

Trade

Table 14.6. **Key fish exports by product form (EUR million)**

2008-10

Species	2008		2009		2010	
	EUR	Tonnes	EUR	Tonnes	EUR	Tonnes
Mackerel	72 881 970	45 762	52 638 241	34 874	51 620 217	37 053
Herring	27 144 510	26 839	10 972 435	10 448	12 645 417	11 146
Horse mackerel	23 542 640	33 939	30 603 485	41 804	30 762 106	42 333
Crab	26 095 040	5 202	26 882 201	6 967	28 373 428	6 959
Mussels	23 864 780	12 473	21 061 259	15 229	21 656 472	16 562
Salmon	14 560 660	2 288	46 999 099	6 173	55 422 172	8 836
Prawn	29 825 730	4 283	32 783 583	5 070	36 879 679	5 464
Whitefish	41 617 720	13 565	40 667 222	16 942	50 187 256	36 944

In 2010, Irish seafood exports were valued at almost EUR 374 million and amounted to just over 274 818 tonnes. This represents an overall increase of almost 13% in value from EUR 332 million achieved in 2009 and a 29% increase in volume; in keeping with general Irish food export trends in 2010.

Irish salmon exports increased by 18% in 2010 to EUR 55.4 million with a 43% increase in volume. There was a notable 27% increase in the value of the salmon fillet product to EUR 36 million with a 62% increase in volume to 6 012 tonnes.

The pelagic export, valued at EUR 122 million, showed a more modest increase in 2010 of 13% in value and 3% in volume to 118 013 tonnes. Exports of mackerel, horse mackerel, blue whiting and herring performed well.

Shellfish remained Ireland's strongest export category valued at EUR 131 million, a 13% increase in value from 2009 with a 7% increase in volume to 38 827 tonnes. Prawns, mussels and oysters performed well with a notable 26% increase in the frozen Dublin Bay Prawn product to EUR 24 million with an 8% increase in volume to 3 903 tonnes. Oyster exports were valued at EUR 16 million, a 28% increased on 2009 with an 8% increase in volume to 5 245 tonnes, reflecting the high-value of the products.

Table 14.7. **Main EU countries Ireland exported to (2010)**

	Volume (tonnes)	Value (EUR million)
France	30 612	100
Spain	11 809	50
United Kingdom	20 851	40
Germany	9 981	22
Italy	39 748	20

Table 14.8. **Main non-EU countries Ireland exported to (2010)**

	Volume (tonnes)	Value (EUR million)
Nigeria	34 277	18
Russia	14 770	17
Egypt	19 754	14

Outlook

The need to ensure sustainable development of fisheries remains of the highest priority, with scientific advice remaining pessimistic for many stocks. At national level, the Seafood Strategy Report was launched in January 2007. The Seafood Development Operational Programme (SDOP), covering the 2007 to 2013 period and co-funded through the European Fisheries Fund, was adopted in September 2008.

The main objectives of the SDOP comprise:

Fleet restructuring and development

To eliminate the imbalance between the available resource and catching capacity of the whitefish fleet, thereby ensuring the future profitable and sustainable development of the whitefish sector.

Marine environment and conservation

The adoption by the industry of an environmentally conscious, responsible, and compliant approach to all their activities is fundamental to the successful implementation of the *Strategy for the Irish Seafood Industry 2007-13* (the *Strategy*). This Operational Programme will work to fulfil the requirements of the *Strategy* and achieve a sustainable seafood industry which respects the marine environment.

Increasing environmental and conservation awareness, promoting local area and coastal zone management, the introduction of Environmental Management Systems, reduction of discarding and the development of environmentally friendly fishing gears are all recommendations central to the *Strategy* and essential if we are to achieve a position wherein we sustainably harvest our marine resources and improve the general health of the marine environment.

These recommendations will require strong policy support at EU and national level. The Irish authorities are committed to taking a leading role at national and EU level in conservation practice and advocacy to ensure strengthened compliance with conservation needs and regulatory requirements.

Social and economic development

To improve quality of life in communities is reliant on fisheries and aquaculture, by supporting then to identify ways to deal with the challenges to their socio-economic stability.

Complimenting the co-funded Programme, the Irish Seafood National Programme (ISNP), funded entirely from exchequer funds, was adopted in July 2010.

The ISNP includes the objectives as listed below.

Market development/ promotion

To establish a seafood industry that captures the full potential value of Irish seafood through a market focused, customer-led development strategy, supported by enhanced trade and promotional activity.

Business development/innovation

The development of a seafood industry with the capability to establish a leading position in delivering market-led innovation with specific focus on R&D, value-added development and application of appropriate technology to remain competitive and profitable into the future.

Processing sector restructuring and development

A strengthened seafood-processing sector with the appropriate scale and operational efficiency was established to compete in an increasingly cost competitive market and with the capability to invest in value-added development to meet customer demands and take advantage of new market opportunities.

Fisheries management

To deliver a catching sector supporting and operating under a Fisheries Management Regime, comprising both a Quota Management System and a Fleet Management and Licensing policy, that incorporates effective control and enforcement mechanisms, promotes biologically sustainable stocks, economic viability and stability for vessel owners, and generates a greater focus on market needs. The objective is also to ensure the balanced development and sustainable management of inshore stocks, based on an integrated Inshore Development Strategy developed in partnership with key stakeholders.

Aquaculture development

To significantly develop and expand the aquaculture sector, within the context of clearly defined national policies, output targets and environmental targets. This will be supported by an Aquaculture Development Programme spear-headed by BIM.

Education and training

To increase promotion of and access to education and training in the catching, aquaculture and shore based processing sectors with greater emphasis to be given to initiatives that cover the following:

- Improve industry participation in commercially focused training programmes and address profitability, efficiency, environmental responsibility and sustainability across all industry sectors.
- Increase the focus on training and qualifications in the inshore and coastal sectors in order to improve levels of safety, competence and profitability within these sectors and improve crew retention.
- Provide increased training to both the aquaculture and shore-based processing sector with a view to increasing professional skills within these sectors and attracting younger entrants to the industry.

- Provide diversification opportunities for those who wish to remain in the maritime sector and assist those who wish to develop alternative careers with support from other State agencies.

The need for enhanced and consistent control and monitoring is another high priority for Ireland. The Common Fisheries Policy has placed particular emphasis on this area and measures are planned within this framework in the coming years.

The need for greater stakeholder involvement in fisheries management has been addressed with the establishment of Regional Advisory Councils. This is a development greatly welcomed by Ireland at both administrative and industry level. At national level advisory committees have been established for key inshore fisheries, which are involved in the development of local management plans. The planned review of the CFP by 2012 continues to be a priority for Ireland, and negotiations are going. The European Commission published a Green Paper on the Reform of the Common Fisheries Policy (CFP) in April 2009 in order to launch a consultation process with Member States to initiate a broad public debate on the future CFP reform. "Ireland's Response to the Commission Green Paper," which was informed and shaped by the results of the consultation process, was submitted to the European Commission early in 2010. From an Irish perspective, the long-tem priority is to have a strong, sustainable and profitable seafood industry that supports fishing and related economic activities in coastal communities.

PART III

Chapter 15

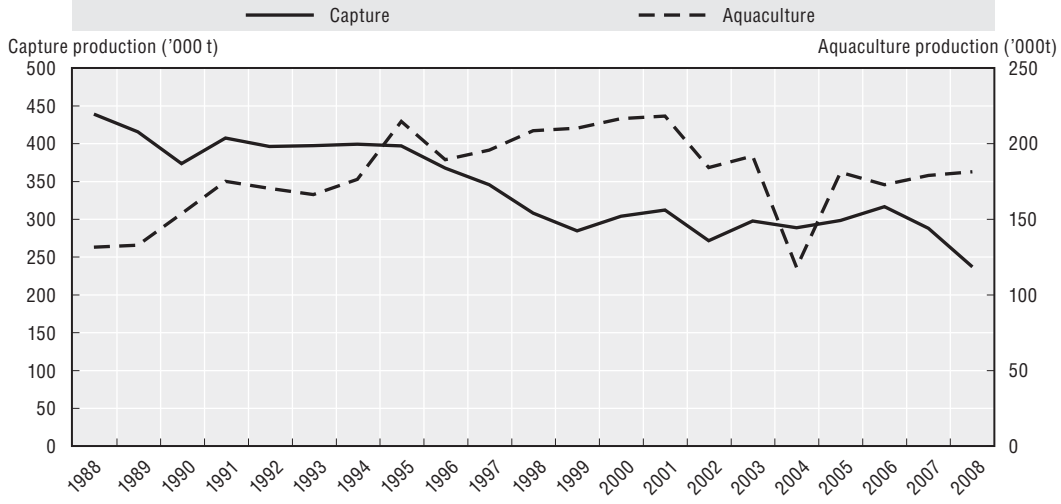
Italy

Italy

Summary of recent developments

- In 2009, the Ministry for Food, Agriculture and Forestry implemented some 20 Adjustment Plans of Fishing Effort in order to achieve a sustainable balance between capacity and resources. The Plans were implemented within the framework of the Fisheries Operational Programme and have been defined by fleet segment and geographical sub-area. The final objective is to reduce the fleet by about 25 000 gross registered tonnes (GRT). For trawlers, an average decommissioning rate of 12.5% in GRT is planned, for demersal fisheries 5%, and 2.1% for pelagic trawling and seine fishing. The Bluefin tuna purse seine fishery will be reduced by 75% in terms of GRT by 2011.
- Since June 2010, the Council Regulation (EC) No. 1967/2006, concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean, has fully entered into force. The measures will phase-out mesh size smaller than 40 mm for trawl codend and impose the substitution with squared mesh size of 40 mm or, following a motivated request from the fishing vessel owner, with 50 mm diamond mesh for a more selective catch.
- In 2010, a Ministerial Decree established an extraordinary temporary withdrawal of fishing activities for trawlers and mid-water pelagic nets for 30 consecutive days of the Adriatic and Tyrrhenian fleets in response to the fuel crisis. Further restrictions were imposed and limited financial compensation mechanisms were established.

Harvesting and aquaculture production (tonnes)

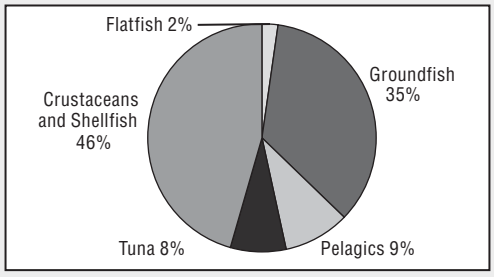


Source: FAO FishStat Database.

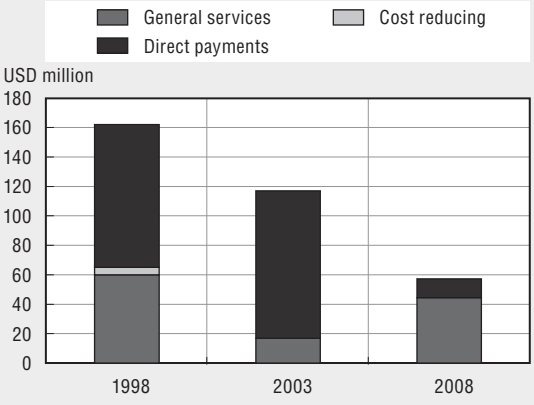
Key characteristics of the sector

- European anchovy is the single most important fish species in terms of volume (approximately 28% of total volume). Cuttlefish, deep water rose shrimp and high value Norway lobster are the main species in the crustaceans and shellfish categories. The latter two are considered fully exploited, while the anchovy stocks are sustainably exploited.
- Government financial transfers for marine capture fisheries are provided mainly for management and research services (general services). Direct payments are used for decommissioning schemes as well as for fleet renewal and modernisation costs.
- The Italian trade deficit in fishery products declined slightly, reaching EUR 3.12 billion in 2008 and EUR 3.07 billion in 2009. The decline in exports reflects a decrease in domestic production. Fish imports in 2008 represented 11% of overall Italian food imports and only 2% of total food exports.
- The Italian fleet continues to decrease. The largest segment in terms of number of vessels, employment and landings is small-scale fisheries with vessels manned on average by two people.
- Aquaculture employment data is not collected systematically. Estimates for 2006 count 1 000 fish farms, mainly in northern Italy, employing about 150 000 people, including those in processing activities.

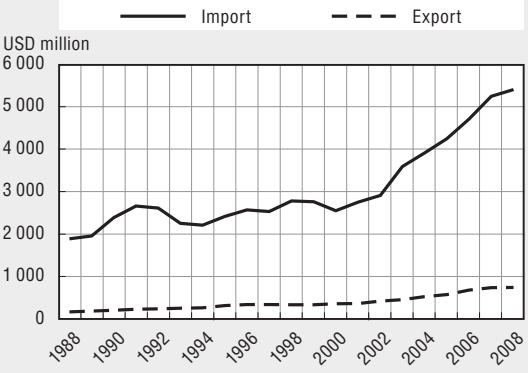
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	49 637	29 562	–40.4
Number of fish farmers	n.a.	n.a.	
Total number of vessels	17 843	13 374	–23.5
Total tonnage of fleets	231 682	182 909	–21.1

Legal and institutional framework

The fisheries policies are implemented within the context of the European Common Fisheries Policy (CFP). Responsibility for fisheries in Italian waters lies with the Ministry for Food, Agriculture and Forestry and the regional governments. Local authorities are entrusted with all competencies in fishery matters; this was previously managed by DG Fishery and Aquaculture concerning artificial reefs, aquaculture, fishing harbour maintenance, processing, trading and inland waters fisheries. The decentralisation process is still in progress and administrative regions are now competent for the realisation of local management plans, while the central administration is responsible for national management plans (developed at geographic service area (GSA) level), which will be implemented for some specific areas and fisheries under the European Fishery Fund.

In line with the CFP, the principal management instruments are based on effort (capacity and activity) regulations together with other complementary technical measures, such as mesh size and area and time closure. The only exceptions regard the management of bluefin tuna (*Thunnus thynnus*), which is regulated by Individual Quotas (IQ) and sedentary species, which are regulated by a self management approach based on Territorial User-Rights in Fisheries (TURFs).

Capture fisheries

Performance

In 2008, the production of the Italian fleet in domestic ports amounted to 216 567 tonnes corresponding to EUR 1.08 billion with a reduction of 20% respect to 2007, both in weight and in value (Table 15.1). This decrease in productivity was mainly due to a reduction in activity as a consequence of the fuel crisis. Between 2007 and 2008, fishing days decreased from 131 days per vessel to 118 while fuel costs reached, over the same period, its peak. This phenomenon has assumed a greater dimension in the last two years and has induced fishermen to change their fishing strategy by reducing days at sea in order to limit operational costs. This happened especially during periods when weather conditions could compromise productivity. This behavioural change (more prudent) involved both larger and smaller vessels. Another important factor contributing to reducing activity levels is the temporary withdrawal that, contrary to previous years, involved all fishing ports.

Table 15.1. **Capacity and economic indicators by fleet segments, 2008**

	Total fleet	Trawlers	Pelagic fleet	Dredges	Small scale fishery	Multi-purpose vessels	Longlines
Capacity indicators							
Volume of landings ('000 ton)	217	81	65	27	33	6	6
Value of landings (EUR million)	1 082	549	118	65	258	44	47
Economic indicators							
Fleet – number of vessels	13 374	2 667	459	698	8 831	486	233
Fleet – total GT ('000)	183	113	31	9	17	7	7
Fleet – total kW ('000)	1 102	534	136	75	244	70	44
Average days at sea	118	147	97	104	111	119	127
Employment	29 348	8 831	2 984	1 427	13 722	1 451	933

Source: MIPAAF – IREPA.

In 2009, total production showed a small increase with respect to 2008 with a total volume of 234 000 tonnes and total value of EUR 1.17 billion, reflecting an increase of around 8% both in the weight and value of the products landed (Table 15.2).

Table 15.2. **Capacity and economic indicators by fleet segments, 2009**

	Total fleet	Trawlers	Pelagic fleet	Dredges	Small scale fishery	Multi-purpose vessels	Longlines
Capacity indicators							
Volume of landings («000 ton)	234	85	77	20	38	10	5
Value of landings (EUR million)	1 179	586	122	63	303	68	37

Source: MIPAAF – IREPA.

In 2008, the Italian fishing fleet consisted of 13 374 active vessels. The total fleet accounted for a combined registered tonnage of 183 000 GRT and a total power of 1 102 000 kW. Data for 2008 and 2009 confirm the decreasing trend in the capacity variables of the previous period (2002-07) by means of scrapping backed by public aid.

The Italian fleet is characterised by a strong multi-species and multi-gear activity. Landings from the Adriatic Sea and the Sicily Channel account for almost two-thirds of national production. Except for 1% of vessels operating in the high Mediterranean waters and outside the Straits (distant water fleet), the majority of vessels operate in coastal waters close to the Italian peninsula.

The small-scale fishery (small fishing boats with an overall length of less than 12 metres using passive gear) is the most important fishery in terms of number of vessels, employment and activity. It accounts for 66% of the total fleet in number of vessels and for about a quarter of the national value of landings. This segment is also the most active with 62% of total days at sea in 2008. Fishermen represent 41% of total employment with an average crew of two men.

The trawling segment is the main fleet segment both in volume and value. In 2008, it produced 37% of total national landings and 51% of the total value of landings, employing around 8 831 fishers (30% of total employment).

Pelagic fisheries are exclusively practiced by vessels authorised to mid-water pair trawl and purse seines. While purse seiners are concentrated in Tyrrhenian and Sicilian waters, mid-water pair trawlers fish exclusively in the Adriatic waters. This fleet accounts for a 30% of all landings in volume and 11% in value.

The other important fishery is represented by dredgers (698 vessels in 2008), almost exclusively located in the central-north Adriatic coast. This fishery is highly specialised targeting mainly clams (*Venus gallina*).

The segment of multi-purpose vessels is composed of polyvalent vessels using passive gears (mainly nets) in combination with mobile gears (mainly trawls) according to season, demand and fishing grounds. In 2008, they accounted for a 4% of total fleet and represented around 3% of national landings in volume and value.

The segment of longlines comprises many types of set and drift longlines used to catch different species, such as swordfish, bluefin tuna, albacore tuna and hakes. Production is concentrated in the Tyrrhenian littoral and particularly in Sicily, where there is the largest fleet. This segment represents around 3% of national landings.

In 2008, as a consequence of the reduction in the number of vessels, employment showed a decline of 2.9% as compared to the previous year.

The main species caught by the Italian fishing fleet are reported in Table 15.3. Within the fish category, the most important species is European anchovy, which represents around 28% of landings in weight and 10% in value. For molluscs, cuttlefish is the most important species, representing 3.4% of the total production and 5.3% of total revenues. The most important crustacean is deep water rose shrimp, followed by high value Norway lobster (1.5% in terms of volume and 5.8% in value).

Table 15.3. **Main species harvested by quantity and value, 2009**

	Tonnes ('000)	%	EUR million	%
European anchovy	54.4	23.2	87.8	7.4
Other fish	31.6	13.5	193.7	16.4
Striped venus	17.3	7.4	51.8	4.4
European pilchards	15.6	6.7	12.7	1.1
European hake	12.0	5.1	90.6	7.7
Deep-water rose shrimp	9.6	4.1	69.9	5.9
Cuttlefish	7.9	3.4	62.7	5.3
Other molluscs	7.6	3.3	46.8	4.0
Mantis squillids	6.5	2.8	39.7	3.4
Striped red mullet	6.1	2.6	30.6	2.6
Swordfish	5.1	2.2	61.3	5.2
Musky octopus	4.1	1.8	16.2	1.4
Common squids	4.1	1.7	21.2	1.8
Horse mackerel	3.8	1.6	6.1	0.5
Norway lobster (Nephrops)	3.6	1.5	68.2	5.8
Total	**234.1**	**100.0**	**1 179.0**	**100.0**

Source: IREPA.

Landings by Italian vessels in foreign ports increased by 12% from 9 282 tonnes in 2007 to 10 444 tonnes in 2008, though the value of these landings decreased by 14% from EUR 27 million in 2007 to EUR 23 million in 2008. Between 2000 and 2008, the value of these landings decreased by nearly 40%, due mainly to the decline in fleet capacity. Landings in foreign ports refer exclusively to the oceanic fleet that in 2008 accounted for 18 freeze-trawlers over 580 GT (14 456 GT; 21 804 kW), operating outside the Mediterranean Sea. At the end of 1990, this fleet amounted to approximately 55 vessels. The key species are yellowfin tuna, skipjack tuna and octopus, which together account for around 80% of all landings in weight and 63% in value. The main fishing areas are Seychelles, Mauritius, Madagascar and Comoros. In addition, there are private agreements with other countries such as Somalia, Kenya, Chagos Archipelago, Mozambique, Mayotte and Iles Eparses.

With 20 000 km^2 of lakes, reservoirs and rivers, inland fishery has an ancient tradition in Italy and takes place with different techniques and gears. In 2008, the inland production amounted to 3 552 tonnes. Although its contribution to national production is very low (1.7%), inland fishery is particularly important in some regions located in northern Italy. The catch comprised trout (20%), carps (10%), pikes and bass (9%), eels (1%) and other fishes (mainly silversides and shads).

Status of fish stocks

Biological indicators of the most important commercial species are available at GSA level (geographical sub areas), which, as recommended by the General Fisheries Commission for the Mediterranean (GFCM, Alicante 2001) and its Scientific Committee, represents the best combination of areas, fishing methods and resources in their variable relations. The assessment produced by STECF-SGMED and SCSA-GFCM on Mediterranean stocks have shown a status of over exploitation for some of the species landed by the Italian fleet. In more detail, hake had been considered as being over-fished since the early 1970s. Given the values of fishing mortality (F) and exploitation rates (E) (the latter one higher than 0.5), the stock of hake can be considered to be at least fully exploited. High exploitation rates (always well above the reference point of 0.5) also apply to striped mullet, Norway lobster, deep water rose shrimp and common sole.

For the pelagic fisheries, European anchovy is considered sustainably exploited. The assessment of this stock was carried out by means of Virtual Population Analysis (VPA), using catch data collected for Italy, Slovenia and Croatia, from 1975 to 2007. Figures for the rate of exploitation (E current) in the last few years are below the precautionary threshold of 0.4 recommended for small pelagic fish. According to the same approach it can be concluded that the sardine stock is being over-exploited. The rate of exploitation in the last few years has frequently exceeded the precautionary threshold of 0.4. In order to decrease fishing mortality, SGMED 09-02 advises to reduce fishing efforts by means of a multiannual management plan. However, the management of the sardine fisheries needs to account for multi-species effects, mainly the interaction with anchovy.

Table 15.4. **Status of fish stocks**

Species	GSA	Period	F target				
			F current	F 0.1 – F max	E current	E reference	Status
European hake	Ligurian Sea, Northern and Central Tyrrhenian Sea – GSA9	2008	1.2-1.7	0.22-0.35			Overexploited
European hake	Ligurian Sea, Northern and Central Tyrrhenian Sea – GSA9	2006	1.6	0.22-0.35			Overfishing
European hake	Central-Southern Tyrrhenian Sea – GSA10	2008	0.55	0.24-0.42			Overexploited
European hake	Sardinia – GSA11	2008	1-2.3	0.17-0.25			Overexploited
European hake	Central-Southern Tyrrhenian Sea – GSA10	2006	0.74	0.35-0.5			Overexploited
European hake	Central and Northern Adriatic – GSA17	2006-07	0.5	0.22			Fully exploited
European hake	Ionian Calabria and Ionian Puglia – GSA19	2006-08	1.1				
Deepwater rose shrimp	Ligurian Sea, Northern and Central Tyrrhenian Sea – GSA9	2006-08	0.5-0.6	0.7			Harvested sustainably
Deepwater rose shrimp	Ligurian Sea, Northern and Central Tyrrhenian Sea – GSA9	2006-07	0.37-0.41	1.3			Underexploited
Deepwater rose shrimp	Central-Southern Tyrrhenian Sea – GSA10	2006	0.88	0.88-1.98			Exploited within the limit RP
Common sole	Central and Northern Adriatic – GSA17	2005-08	1.35	0.26-0.46			Subject to overexploitation
Striped mullet	Ligurian Sea, Northern and Central Tyrrhenian Sea – GSA9	2008	0.85	0.49-0.62			Overexploited
Striped mullet	Ligurian Sea, Northern and Central Tyrrhenian Sea – GSA9	2007	0.86	0.42-0.63			Overfished
Striped mullet	Central-Southern Tyrrhenian Sea – GSA10	2006	0.6	0.37-0.53			Overfishing
Striped mullet	Central and Northern Adriatic – GSA17	2006-07	0.62-1.08	0.5	0.5	0.5-0.63	Sustainably exploited
Norway lobster	Ligurian Sea, Northern and Central Tyrrhenian Sea – GSA9	2006-08	0.32-0.36	0.21-0.36			Fully exploited
European anchovy	South of Sicily – GSA16	2008	1.17		0.64	0.4	E higher than the proposed
European anchovy	Central and Northern Adriatic – GSA17	2005-07	0.23	0.4	0.28	0.4	Sustainably exploited
European pilchard	Central-Southern Tyrrhenian Sea – GSA10		0.14		0.22	0.4	Sustainably exploited
European pilchard	Central and Northern Adriatic – GSA17	2008			> 0.4	0.4	Overexploited

Management of commercial fisheries

Management instruments

The only stock regulated by Individual Quotas (IQ) is bluefin tuna. In order to rebuild the stock, the new ICCAT recovery plan provides for a graduated reduction in the total allowable catch level from 2007 to 2011, restrictions on fishing within certain areas and time periods, a new minimum size for bluefin tuna, measures concerning sport and recreational fishing activities, farming and fishing capacity measures as well as reinforced control measures and the implementation of the ICCAT scheme of joint international inspection to ensure the effectiveness of the recovery plan. The ICCAT recovery plan of 2008 was incorporated in Community law by Council Regulation (EC) No. 302/2009 of 15 April 2009 establishing a multi-annual recovery plan for bluefin tuna in the Eastern Atlantic and Mediterranean. According to this regulation, the Italian Administration fixed the annual quota of the Italian fleet for 2009 at 3 176 tonnes.

Management of recreational fisheries

In Italy, recreational fishery is regulated by the same rules that apply to sea fishing. The main provisions are the Law 963/1965 lying down the "Discipline of marine fisheries", the regulations for its implementation, various ministerial decrees and the Mediterranean Regulation No. 1967/2006. According to these provisions, recreational fisheries are all activities practiced with a recreational or agonistic purpose. Sport fishers are only allowed to use fishing line and none of the other designated commercial fishing gears. There is also a daily 5 kg bag limit, with the harvesting of mussels for recreational purposes limited to 3 kg per day. Regulations such as respecting fishing periods and minimum size of the fish must be followed. Fish caught in recreational fisheries cannot be sold and there is no obligation to hold a fishing licence.

Under the decentralisation process concerning the transfer of administrative competencies from the central administration to regions, local authorities have begun to legislate in this matter with a high level of diversification. In some cases regional laws have amended or supplemented the previous national rules through the introductions of more stringent rules. For instance, in some regions although recreational fishing is not subject to a licensing system, fishers involved in such activities are required to be members of a national recreational fishing federation and to report catch data.

In accordance with Article 27 of EC Regulation No. 1224/2009 establishing a Community control system for ensuring compliance with the rules of the Common Fisheries Policy, the national authority recently launched a study for the rationalisation of the sector with the objective of defining the dimension of the Italian recreational fishery. In March 2010, the Ministry for Food, Agriculture and Forestry has signed an agreement protocol with the Italian Fishing Federation (*FIPSAS*) aiming to implement a census of recreational fishermen and a comprehensive control system. No official data are available about recreational catches. From information on the number of licences issued, there are around 2 million anglers in Italy. About 30 000 are members of the Italian Fishing Federation.

Aquaculture

Production facilities, values and volumes

Between 2007 and 2008, Italian aquaculture production decreased by 3.9% in terms of weight and by 7.3% in terms of value, mainly because of the negative performance of the

mollusc sector. In 2008, total aquaculture production was 237 520 tonnes with a value of EUR 607 million. The shellfish segment accounted for around 70% of total national production in volume and around 43% in value. Sea fish production represented around 12% in volume and around 30% in value. Freshwater production was around 19% in volume and around 24% in value.

Most Italian fish farming production consists of freshwater species, particularly trout, catfish and sturgeon. In particular, trout represents the most popular reared species and makes Italy a major EC producer. Among the brackish waters, the most important species are European sea bass and sea bream. Salt and brackish water aquaculture also provides for the breeding of other minor species like white sea bream, shi drum and grey mullets. Of relevant importance is the Italian production of molluscs, which usually are reared in fishing valleys and, in a few cases, in basins bordering fish farms. In particular, mussels alone represent around 48% of the total Italian production in weight and 13% in value.

There is no recent data for employment and the number of farms. The latest reliable figures refer to the situation in 2006 (ICRAM – API, 2007). According to these data, there were a number of fish 1 000 farms that employed around 150 000 people (this number takes into account the processing sector). Around 60% of the farms are located in the northern regions, where the inland and shellfish farming businesses are concentrated.

Table 15.5. **Aquaculture production**

	1 000 tonnes	Var. 08-07 (%)	EUR million	Var. 08-07 (%)
Fresh water				
Rainbow trout	39.4	–0.8	131	–1.5
Eel	1.6	–5.9	13	–13.3
Sturgeon	1.35	0.0	14	16.7
Other fish (catfish and carp)	1.3	0.0	5	0.0
Brackish waters				
Sea bass	9.8	–1.0	68	–2.9
Sea bream	9.6	–2.0	62	–3.1
Mullet	3.5	16.7	12	–7.7
Other fish[1]	5.97	11.2	39	5.4
Total fish	**72.52**	**0.6**	**345**	**–0.9**
Mussel[2]	115	–8.0	77	–6.1
Clam	50	0.0	185	–17.8
Total shellfish	**165**	**–5.7**	**262**	**–14.7**
Total aquaculture	**238**	**–3.9**	**607**	**–7.3**

1. Other fishes include shi drum, white seabream, common dentex, perch, seabasses, brook trout, Northern pike and since 2006 bluefin tuna.
2. It also includes mussels from natural bank.

Source: API.

Government financial transfers

In 2008, more than 80% of the total government financial transfers have been allocated to the harvesting sector. Over the same period, marketing and processing received around 16% of total transfers while the remaining 2% was attributed to the aquaculture sector.

Government financial transfers to the harvesting sector were primarily destined to management and research services (64%), while direct payments represented around 18% of total transfers. Within direct payments, around 5% of total transfers consisted of decommissioning costs and around 7% refers to renewal and modernisation costs.

Markets and trade

Markets

Trends in domestic consumption

The reduction in revenues recorded in 2008 in the fishing industry had repercussions on both domestic consumption and international trade. Per capita consumption amounted to 20.5 kg in 2008, a reduction of 7% compared to 2007. For 2009, per capita supply is expected to remain stable around 20 kg.

Household purchases of fish decreased by 1% in 2007-08. The main category affected by this reduction is fresh fish with a reduction of 3% compared to 2007. The other main categories remained relatively stable, with the exception of frozen seafood which increased by 0.5% during the same period. For 2009, a recovery in consumption of fresh products and an increased demand for processed products is expected.

Trade

Volumes and values

In 2008, the Italian trade deficit of fish products showed a slight decrease (–0.5%), reaching EUR 3.12 billion. The reduction in imports (respectively –2.1% and –1% in volume and value) was due to reduced domestic consumption. Over the same period, decreasing exports (respectively –7.1% and –3.6% in volume and in value) reflect the decline of both foreign demand and national production. In 2009, the slight worsening of the balance of trade (–1.8% in value) benefitted from lower export prices. Fishery imports in 2009 totalled about EUR 3.56 billion, while exports stood at EUR 494 million with a net balance of EUR –3.07 billion.

The fisheries sector continues to play an important role in the food trade deficit, considering that in 2008 fish products accounted for 11% of total food imports but only 2% of total exports. In 2008, imports of prepared or canned tuna (which accounted for approximately 12% of total imported processed products) rose by 8.3%, as opposed to a stagnation of fresh or frozen products and other processed products. In 2009, the slight increase of exports mainly affected non-European Union countries (particularly Tunisia) and involved mostly processed products.

Table 15.6. **Import-export trade of fishery products**

	2008	Var. 08-07 (%)	2009	Var. 09-08 (%)
1 000 t				
Import[1]	896	–2.1	913	1.9
Export[1]	131	–7.1	133	1.2
Balance	–765	–1.2	–780	2.0
EUR million				
Import[1]	3 655	–0.9	3 s565	–2.5
Export[1]	528	–3.6	494	–6.4
Balance	–3 127	–0.5	–3 071	–1.8

1. It includes only commodities for human consumption.
Source: Icram and ISTAT data processed by IREPA.

PART III

Chapter 16

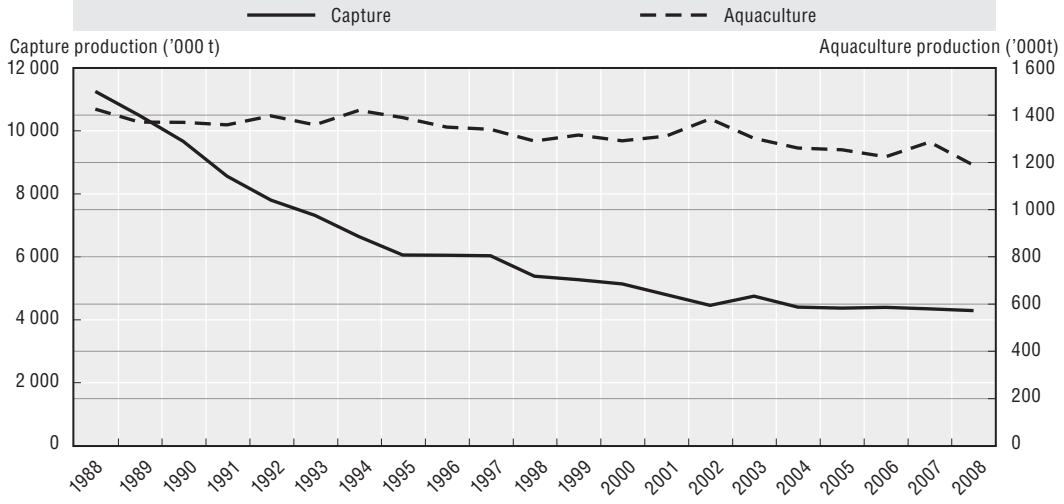
Japan

Japan

Summary of recent developments

- Overall, Japan's fishery production decreased over the years 2000, although certain sub-sectors were rather constant. Employment and capacity is continuously decreasing. The stock status of about half of the commercial species around Japan is low, while the status for the rest are at high or middle levels. While still significant and strong, domestic fish consumption has decreased.
- Japan's central and prefecture governments employ multiple layers of management schemes and procedures including total allowable catch (TAC) and total allowable effort (TAE) systems. Resource recovery plans for deteriorated stocks will be developed and implemented in co-operation with stakeholders. Environmentally sustainable aquaculture is pursued by fishers' co-operatives under domestic legislation. Public and private initiatives continue to recover and maintain sound natural environments for sustainable fisheries. The basic master plan of Japan's fishery policy was renewed to implement comprehensive policy packages.
- As a member of the international community that harvests and imports considerable amounts of fish and fish products, Japan continues to actively participate in international organisations dealing with international fisheries. It strongly supports regional fisheries management organisations in particular, with respect to measures against IUU fishing. Bilateral fishery agreements and arrangements regulate international fishing opportunities of Japanese fishing vessels.

Harvesting and aquaculture production (tonnes)

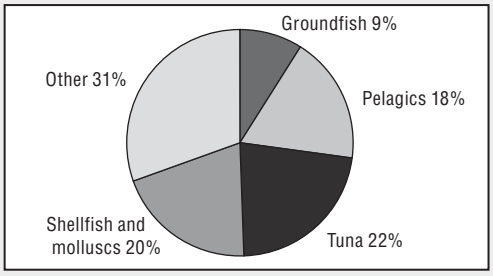


Source: FAO FishStat Database.

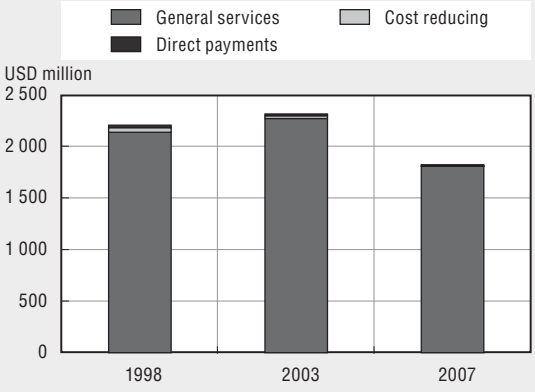
Key characteristics of the sector

- The total value of the Japanese fisheries production dropped from JPY 1.633 billion in 2007 to JPY 1.613 billion in 2008. Some commercial stocks are under pressure and the government is implementing resource recovery plans.
- Total government expenditure for the fisheries sector was JPY 211 billion in the fiscal year 2008, a slight drop compared to the JPY 211 billion in 2007.
- A fleet reduction programme started in 1981 is the only activity which counts as a direct payment. Cost reducing transfers take mainly the form of interest subsidies, while public infrastructure is the main element in the general service category.
- Japan's fish imports remain at high levels. In 2007, shrimp and prawn had the largest value among imported fishery products, followed by tuna and tuna-like species, salmon and trout and crab with China being the main supplier of seafood. As a new trend, export of fish products from Japan is steadily increasing. By 2008, exports had increased to JPY 209 billion – 26% more than a decade ago. This trend reflects the acceptance of Japanese seafood in major markets as well as the economic development of other Asian countries.
- The calculation method for employment in fisheries changed in 2008 and cannot be properly compared to that of previous years. It remains, however, that the aging of active fishers remains a problem, with 36.4% of the total male workforce being 65 years or older.
- Although no recent figures are available, the Japanese fishing fleet continues to decrease in terms of number of vessels and in terms of capacity.

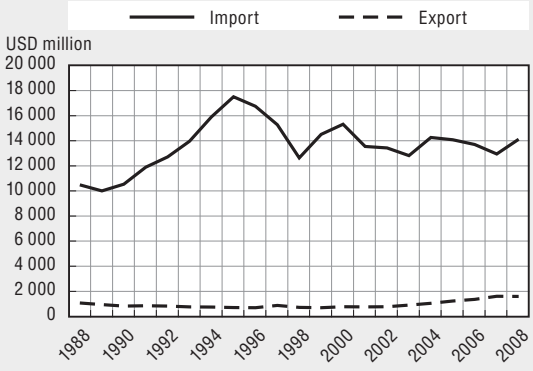
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	260 200	221 896[1]	–14.7
Number of fish farmers	56 190	n.a.	n.a.
Total number of vessels	209 832	n.a.	n.a.
Total tonnage of fleets	n.a.	n.a.	n.a.

1. Includes fish farmers and processing.

Legal and institutional framework

The Government of Japan enacted the Basic Law on Fisheries Policy in June 2001. It replaced the Coastal Fishery and Others Promotion Law of 1963, whose primary aim was to improve fishery productivity, in particular that of coastal small scale fisheries. Reflecting the change of socio-economic environments of fishery and its related sectors, the Basic Law on Fisheries Policy restructured Japanese fishery policy frameworks. It enlarged its purpose in a comprehensive manner, encompassing sustainable management of living marine resources and sound development of the entire fishing industry including processing and distribution. It has two basic policy guideline concepts: 1) securing a stable supply of fishery products to Japanese nationals; and 2) the sound development of the fishing industry by promoting appropriate conservation and management of marine living resources. It also clearly establishes the basic direction for various specific measures to be implemented under these concepts.

In accordance with the provisions of the Basic Law on Fisheries Policy, the Basic Plan of (Japanese) Fishery was developed by the government in March 2002 to embody basic concepts and principles stipulated in this law. The Basic Plan includes, in particular, the basic policy statements for fisheries, the target of self-sufficiency rates for fish and fish products, and a comprehensive policy package for the government and various stakeholders to pursue policy objectives set out in the basic law.

In March 2007, Japan reviewed and renewed this plan, taking account of the current situation of Japanese fisheries and food supply, such as structural change in fishing and related industries and the deteriorating status of fisheries resources. This revised plan promotes further refinement and the timely implementation of Japan's policy on fisheries in a changing domestic and international environment.

In addition to the Basic Law on Fisheries Policy, key laws for fisheries management are the Fisheries Law, the Living Aquatic Resources Protection Law and the Law Concerning Conservation and Management of Marine Living Resources. These principal laws were also amended and administered in line with the concept of the Basic Law on Fisheries Policy. In accordance with these legislations, Japan manages its fisheries through various measures including the management of fishing effort and catch regulations. Central and prefectural governments put in place the limitations on the number of licenses issued for each fishing type and the restrictions on fishing periods, methods and gears.

A TAC system was established in 1996 as a domestic institution for catch limitation of several important species (*e.g.* saury, jack mackerel, sardine). This system assigns its catch allocations to each fishery or prefecture government, not to individual fishers. The seven fish species subject to the TAC system account for 1 324 thousand tonnes, that is about 32% of the total capture production in Japan in 2009. In addition, a TAE system was established in 2003 to manage total allowable fishing efforts for certain species whose stock status has deteriorated and which are subject to the Resource Recovery Plan, to be developed in accordance with the amendment of the Law Concerning Conservation and Management of Marine Living Resources.

These fishery management systems noted above apply mainly to Japanese fisheries in its exclusive economic zone (EEZ). Operations by foreign fishing vessels in the Japanese EEZ are prohibited unless permitted under specific bilateral intergovernmental fisheries agreement. As a flag state, fishing operations by Japanese fishing vessels in high seas and EEZs of foreign states are also regulated by the Japanese fishery legislation such as The Fisheries Law.

Capture fisheries

Fisheries production (including marine fisheries, inland fisheries and aquaculture) has decreased in quantity since 1989. Production amounted to 5.592 million tonnes in 2008, and slightly decreased to 5.429 million tonnes in 2009 (–2.9%). There are several reasons for the decrease such as regime changes for Japanese sardine stocks and other species, deterioration of stock status and the reduction of fishing efforts. From a short or medium perspective, decreasing trends were observed in particular for distant water fishing and inland water fishing. On the other hand, the production of offshore fishing, coastal fishing and marine aquaculture is relatively constant.

The value of fisheries production in 2007 was JPY 1.633 billion. It slightly decreased to JPY 1.613 billion in 2008.

The number of Japanese fishers has continuously decreased over the last years. More precisely, the number in 2008 was 221 910. Since the calculation method has changed, this figure cannot be properly compared to that of the previous year (204 330). Male fishers of 65 years of age or above accounted for 36.4% of the total male fishing workforce in 2006, which is 11.6% higher compared to ten years ago. Aging of the working population in the Japanese fishing sector has significant in this past decade.

The number of Japanese fishing vessels has continuously decreased since 1980. The total number of registered fishing vessels in 1980 was 401 350. This figure dropped by about 21.8% over two decades, to 313 870 in 2004. In terms of fishing capacity, significant reduction has been observed in larger fishing vessels. The registered number of vessels of ten tonnes or more has been reduced to nearly half over the same two decades, resulting in 12 916 in 2004.

The number of working fishing vessels actively engaged in fishing operation is significantly less than that of registered fishing vessels. In 2005, the total number of working vessels was 216 196. Of these, 95% or 206 089 vessels are less than ten tonnes or vessels without engines. The number of working fishing vessels which have a size of 10 tonnes or more but less than 20 tonnes was 8 692 in 2005. That same year, 1 815 vessels were 20 tonnes or more.

Resource status

Japan has intensified its monitoring activities of the resource status of the main fish stocks around Japan over the past 20 years. Taking account of the historical fluctuations of these stocks, Japanese public research institutions classify them into three categories (high, middle, low) in terms of their relative abundance. In 2008, the resource levels of 15 stocks, including saury and common squid, were classified as high. Those of 42 fish stocks, such as common mackerel, sardine, and Alaska Pollack, were classified as low, and the other 28 stocks, including Jack mackerel, were classified as middle.

Because of excessive fishing effort of target fish species and/or the deterioration of natural aquatic environments on which reproduction of species depends, the stock status of certain species has worsened. The necessity to rebuild important marine living resources by reducing excessive fishing effort and restoring fishing grounds and nursery areas is increasingly recognised.

In accordance with the Basic Plan for the Japanese Fishery, which was adopted in 2002, a framework for Resource Recovery Plans to implement the necessary measures for rebuilding resources in a comprehensive and planned manner was established. Under the

framework, either national or prefecture governments assume a role of formulating specific resource recovery plans according to the nature of the stock or fishery in question. The plan will be developed and implemented in cooperation with stakeholders including fishers utilising such resources. In order to implement the plan, various measures such as the reduction of fishing efforts (*e.g.* decrease in the number of boats, suspension of operations, modification of fishing gear), active resource enhancement (*e.g.* release of fry) and preservation and rehabilitation of the environment of fishing grounds (*e.g.* maintain of sea grass beds or tidal flats) are employed.

As of March 2010, 50 plans for specific fish species and 16 comprehensive plans for areas and fishing types were developed or under development either by the central or prefecture governments. The number of plans is increasing steadily and the areas for which these are being developed has been extended throughout Japan.

Access agreements

Inter-governmental agreements granting Japan's fishing vessels access to foreign waters as of 2008 are as follows: Australia (since 1979), Canada (since 1978), China (since 1975, new agreement since 2000), France (since 1979), Kiribati (since 1978), Republic of Korea (since 1965, new agreement since 1999), Marshall Islands (since 1981), Morocco (since 1985), Russia (since 1984), Solomon Islands (since 1978), Senegal (since 1992) and Tuvalu (since 1986). Among these nations, access by Japan's fishing vessels to some nations (*e.g.* Australia, Canada, and France) was not obtained. Those with Russia, China and Korea are mutual fishing access agreements through which, under certain agreed conditions, both governments allow fishing vessels to access its EEZs on a reciprocal basis.

The private sector-based agreements or arrangements that allow Japan's fishing vessels access to foreign waters include: Cape Verde, Côte d'Ivoire, Equatorial Guinea, Fiji, Gabon, Gambia, Guinea, Guinea Bissau, Madagascar, Mauritania, Mauritius, Micronesia, Mozambique, Nauru, Palau, Papua New Guinea, Sao Tome and Principe, Seychelles, Sierra Leone, St. Helena, and Tanzania.

Most of the above agreements are for tuna fishery. This is because it is one of the most viable sub-fishing sectors of Japan and diverse fishing opportunities across oceans are necessary to secure the harvesting of this highly migratory species. Terms and conditions of the access agreements vary from country to country.

Management of recreational fishing

Based on the provisions of the Fisheries Law and the Living Aquatic Resources Protection Law, prefectural governors may issue regulations for certain types of recreational fishing in the waters under their responsibilities. These provisions regulate fishing gears and methods for recreational fishing. Many prefectural governors also established additional restrictions (*e.g.* closed areas, minimum size).

In general, the total catch from recreational fishing is marginal because almost all recreational fishing is conducted with rod and reel of small vessels, whose capacity is limited compared to commercial fishing. The estimated catch by recreational fishers who employed a professional guide for marine fishing is 29 000 tonnes in 2008, equal to 2% of the commercial catch in the same year and the same coastal area.

The number of persons who engage in marine recreational fishing with guided services was 3 973 thousand man-days in 2008**.** Since recreational fishing and commercial

fishing use the same waters, conflicts are reported concerning the use of fishing grounds and resources as well as the place of moorage for vessels on shore. Each prefecture government dealing with these problems is taking measures to resolve such conflicts; for example, stakeholder meetings to discuss the use of marine space and the rules governing a specific marine area on a local basis.

Monitoring and enforcement

The United Nations Convention on the Law of the Sea (UNCLOS) entered into force in 1994 and was ratified by Japan in July 1996. UNCLOS established 200 mile EEZs for coastal nations and Japan had to renew its bilateral fisheries relationship with some of its neighbour nations. The new bilateral fisheries agreements with Korea and China entered into force in 1999 and 2000 respectively. Japan has instituted necessary marine living resource management measures in its EEZ in accordance with the rights and responsibilities of UNCLOS. Japan also reinforced its enforcement measures against foreign fishing vessels licensed by Japan to operate in its EEZ, such as inspection of vessels in the waters of Japan's jurisdiction and seizure of illegal vessels and fishing gears.

International conservation agreements

Japan has been actively participating in various international fora dealing with international fishery issues, including the United Nations (UN), Food and Agriculture Organization (FAO) and Organisation for Economic Co-operation and Development (OECD). Japan is a member of many Regional Fisheries Management Organizations (RFMOs) such as the International Commission for the Conservation of Atlantic Tunas (ICCAT), the Inter-American Tropical Tuna Commission (IATTC), the Commission for Conservation of Southern Bluefin Tuna (CCSBT) and the Indian Ocean Tuna Commission (IOTC). Since Japan joined the Western and Central Pacific Fisheries Commission (WCPFC) in July 2005, Japan is a member of all the tuna RFMOs. In January 2007, Japan hosted the Joint Tuna RFMO Meeting in Kobe city in order to facilitate and co-ordinate each tuna RFMO's activities from a global perspective.

Japan also continues to take measures against illegal, unreported, and unregulated (IUU) fisheries. It has started a new global trade monitoring and controlling system based on the Positive Vessel Listing Schemes of ICCAT, IOTC, and IATTC in 2003. Only tuna products caught by large-scale tuna long-line vessels listed in the "Positive Lists" can enter the Japanese market.

Aquaculture

The aquaculture sector suffers from the environmental deterioration of aquaculture grounds due to excessive stocking intensity and over-feeding for increased production as well as due to pollution from non-aquaculture related activities. Environmental deterioration directly and indirectly increases the risk of farmed fish to become ill or less developed, thereby significantly reducing the productivity of aquaculture. In addition, since there is commercial pressure to diversify farmed species, an increased amount of fish seed is import from abroad. As a result, the risk of exotic infectious diseases is increasing.

In order to cope with these problems the Law to Ensure Sustainable Aquaculture Production was introduced in May 1999. This law provides a framework for secure and sustainable aquaculture practices. It includes procedures for fishers' cooperatives to

promote the development of voluntary plans to maintain and improve the environment of aquaculture grounds, thus preventing specific fish diseases.

Aquaculture has several advantages compared to wild capture fisheries as it is easier to plan production and secure a stable supply. With these advantages, the value and quantity of aquaculture production (mainly marine aquaculture) had increased steadily, responding to increasing consumer demand for high valued fish species. However, production has been levelling off recently due to limited availability of suitable aquaculture sites and to restrained market price resulting from over-supply of framed fish.

The volume of aquaculture production has been relatively stable for the last decade with an annual output of 1.1-1.4 million tonnes annually. In 2008, aquaculture production was 1.19 million tonnes, slightly less than the 1.28 million tonnes in 2007. Aquaculture accounted for 21% of the total Japanese fisheries production in 2008.

The total value of aquaculture production has decreased continuously due to the general price decrease of fish and fish products in Japan. In 2008, the value of marine aquaculture amounted to JPY 403 billion. In terms of value, aquaculture contributed 25% of the total fisheries production in Japan in the same year.

Fisheries and the environment

Since reproduction of fishery resources is based on the natural environment, the conservation of critical habitats for marine living resources is an integral part of fisheries policy. For example, sea grass beds and tidal lands provide nursery and spawning areas for various coastal marine organisms, including valuable fishery resources. They also have an ecological function to purify sea water. In addition, forests along coastal area and river have been historically preserved to maintain aquatic environments. The importance of conserving these areas has drawn increasing public attention.

In the past the natural conditions of the seashore (*e.g.* seaweed beds, tidal lands, coral reefs) deteriorated rapidly due to coastal developments and other human activities, as well as to the natural factors including the raise of sea water temperature. A total of 65 156 ha or approximately 30% of the sea grass beds in Japan have disappeared between 1978 and 1998. Similarly, 33 241 ha or around 40% of the tidal lands in Japan had vanished between 1945 and 1998.

In order to restore deteriorated natural environments, the government has strengthened its efforts in this regard (*e.g.* removing sediments from seafloor, releasing sea grass spores into seashores). In addition, fishers frequently organise voluntary beach clean-up activities. A government survey from 2003 shows that more than 90% of the fishery communities had actually engaged in beach clean-ups. Fishers' co-operatives also engaged in organised reforestation in their own basin areas (*i.e.* upstream mountains). This is because members of the coastal communities generally share the recognition that the natural components of forests, rivers and coasts constitute one integrated ecosystem that sustains the reproduction of fishery resources. The annual national report of fisheries in 2007 (*suisan-hakusyo*), which was submitted to the 169th Session of the Japanese Diet held in 2008, highlights these nation-wide bottom-up efforts.

In addition to environmental conservation, some attempts are made to improve the energy efficiency of fishery operations. These efforts include the introduction of LEDs (light-emitting diodes) as substitute of traditional electric bulbs for lighting in night operations of squid jiggers and saury stick-held dip net.

Government financial transfers

The government of Japan expended JPY 218 billion and JPY 211 billion in the fiscal year 2007 and 2008 respectively. The details are given in Table 16.1. As compared with those of previous years, the total figure is gradually decreasing due to the difficult financial situation of Japanese government.

Table 16.1. **Financial support of marine capture fisheries 2007-08 (JPY million)**

	2007	2008
Marine capture fisheries	214 448	208 088
Direct payments	1 506	1 430
Payment for fleet reduction	1 506	1 430
Payments for temporary cessation of fishing operation		
Cost reducing transfers	363	285
Support for introduction of vessels and gear	363	285
General services	212 580	207 421
Cost recovery charges	0	0
Aquaculture	1 411	1 343
Direct payments	0	0
Cost reducing transfers	0	0
General services	1 411	1 343
Marketing and processing	2 042	2 241
General services	2 042	2 241
Grand total	**217 901**	**211 290**

There are no market price support payments for fisheries products. The average tariff on fishery products is 4.1%.

Japan does not provide any government payments for fisher's investment in new vessels nor payments for access to foreign waters. The only direct payment programme in Japan is a national fishing fleet reduction programme started in 1981. This programme is part of a national resource management scheme and is designed to contribute to the conservation of fishery resources. A total of 1 615 mid- to large-scale fishing vessels were scrapped under this programme from 1981 to 2004. All fishing licences of the scrapped vessels are revoked. An additional 122 vessels were scrapped between 2005 and 2008. The type of these vessels include, but are not limited to, high sea driftnet fishing vessels, large- and mid-sized purse seiners, large trawlers, large- and mid-sized squid jiggers, and pelagic tuna long liners.

Under this scheme, all vessels shall be completely scrapped (body panels must be dismantled and the engine shaft must be destroyed) to become eligible for government payment. Any re-sale, re-use or export of the vessel is prohibited. The vessel owners are required to share a substantial part of the scrapping costs* with the rest of the amount paid by the government.

A major type of cost reducing transfer in Japan is interest subsidy. The interest subsidy programme is designed to assist the structural adjustment of small- and mid-size enterprises under certain conditions. The main purpose of the programme is to contribute

* Approximately 56-33% of the costs are shared by vessel owners.

to the introduction of advanced fisheries' management for structural adjustment of coastal small fisheries. Actual differences between commercial and the subsidized interest rates were within a range of 1.25 to 0.01% in FY 2000.

Renewal of small fishing boats and equipments are supported in the programme in an effort to improve safety at sea on family owned coastal boats. This programme apparently does not contribute to the increase of fishing capacity, because Japan restricts the number of fishing vessels as well as the size of each vessel through the licensing scheme of the government. In fact, the number of coastal fishing boats, as well as the production volume of coastal fishery, is decreasing continuously although these coastal fisheries are eligible to receive this subsidy. This government support is conducted along with national and regional fishery resource management so that any adverse impact on the resource is avoided.

The most significant general service expenditure is the construction of public infrastructures including fishing ports, breakwaters, public wharves, navigation routes, coastal community roads, community water supply, sewerage systems, and park facilities around the ports. This accounts for approximately 70% of the government financial transfers to fisheries and coastal communities.

As of 2008, there were 2 921 fishing ports in Japan. They are mainly located in geographically disadvantaged areas. Coastal communities are always threatened by natural disasters such as typhoons and tsunamis. Public services such as sewerage systems in most of these areas are still underdeveloped which causes inconvenience for the inhabitants and the natural environment. The objective of this government service is to improve maritime transportation safety and to enhance living standards of regional communities. This expenditure does not constitute payments to fishing industries but rather to construction sectors.

General services, other than coastal infrastructures, include wide variety of government transfers. These transfers include, but are not limited to, the following items:

- government costs for monitoring, surveillance and control of fisheries operation – this cost includes the construction of government patrol vessels;
- domestic educational and information dissemination services related to fisheries;
- research and development, including operational costs of the National Institute of Fisheries Research and the National Fisheries University.

This category of government financial transfer also does not constitute direct payments to the fishing industries.

Post-harvest practice and policies

In order to implement the regulation relating to food hygiene, the inspectors of food hygiene appointed by the prefecture governments conduct surveillance of bacteria numbers, anti-bacteria substances and environmental pollutants in food and the proper utilisation of food additives. They conduct this surveillance by sampling at wholesale market, cold storage facilities, retail stores and other places on the basis of the Food Hygiene Law. All marine products (domestic products or imported products) are subject to the surveillance.

Large fish processors in Japan have started to introduce the hazard analysis and critical control points (HACCP) system for quality and sanitation control purposes. It is necessary for these enterprises to have quality and sanitation control experts and to

maintain the system in a proper condition. The enterprises in some cases have to make a considerable investment in these facilities. These requirements make it difficult for small- and medium-sized processors to introduce HACCP. To mitigate these problems, the Government of Japan introduced loans for the introduction of the HACCP system and developed manuals of quality management of fish products under HACCP.

There are growing interests and concerns of Japanese consumers about food quality and safety, including fish and fish products. They therefore request information such as origin of material and ingredients of the products. The Law Regarding the Adjustment of the Standardisation and Quality Display for Agriculture and Forestry Goods was revised in 1999. Accordingly, all unprocessed seafood and several processed seafood is now required to display that type of information (*e.g.* origin of the product).

In May 2003, the Food Safety Basic Law was enacted in order to respond to growing concerns over food safety. In July 2003, the Ministry of Agriculture, Forestry, and Fisheries (MAFF) established the Food Safety and Consumer Affairs Bureau to deal with consumer relationship and risk management in the field of food production and distribution.

On 29 May 2006, Japan introduced the positive list system for agricultural chemicals remaining in foods (system to prohibit the distribution of foods that contain agricultural chemicals above a certain level). The agricultural chemicals include pesticides, feed additives and veterinary drugs. This activity has been based on the Law to Partially Revise the Food Sanitation Law of 2003.

The traditional and main marketing distribution pattern for fish and fish products in Japan is as follows: after the landing, prices are set and products are sorted out at the wholesale market in production areas (*e.g.* Kamaishi wholesale market in Iwate Prefecture) according to the destinations and the fish is supplied to retailers through the wholesale market in consumption areas (*e.g.* Tsukiji wholesale market in Tokyo Metropolis) where products are transferred from producing areas. Final retail sales for consumers are made through large supermarkets or traditional fish mongers.

In recent years, the share of large supermarkets as fish retailers is increasing. According to a survey conducted by the government in 2003, 68% of the consumers selected large supermarkets for the purchase of fishery products. This is a remarkable increase compared with the figure of 49% in 1993. Convenient location and price competitiveness of the supermarkets are the main reasons for this general trend. Consequently, the share of traditional fish mongers (or small fish retailers) has decreased to become 15% in 2003. Although updated figures of these parameters are not available since this type of survey was not conducted since then, it seems this general tendency remains.

The channels through which fish and fish products are distributed and purchased are diversifying both internationally and domestically. Direct purchases from domestic producers and international trade of fish by retailers (*e.g.* supermarket and restaurant chains) have increased to pursue economic efficiency. In addition, final consumers are exploring alternative opportunities to purchase fresh fish and fish products at a reasonable price directly from fisher's cooperatives through their markets or internet. These facts mean that more fish and fish products are distributed outside the conventional channels of wholesale markets.

The number of fish processing enterprises has decreased recently to a total of 8 816 in 2008. Small-scale enterprises, which employ less than 20 people, account for three quarter of the total number of processors.

Market and trade

In Japan, the demand of fishery products for human consumption has slightly decreased in these years. Total demand was 7 268 and 7 154 thousand tonnes in 2007 and 2008 respectively. Demand, which was 8 768 thousand tonnes in 1996, has decreased 18.4% from 1996 to 2008. This decreasing trend can be partly explained by the change in lifestyle and consumer preferences, particularly those of the younger generations in Japan. In general, however, Japanese consumers maintain strong interests for fish and fish products, in particular, fresh fish from domestic markets.

The demand of fishery products for non-human consumption peaked in 1988 at 4 577 thousand tonnes. In general, it has been decreasing since then due to the decreased production of sardine resulting in the shift of aquaculture feed to compound feeds. The demand was 2 250 thousand tonnes in 2008, a slight decrease of 1.4% from the previous year.

Japanese import of fish and fish products, once increasing sharply, has been slightly decreasing for several years, amounting to 2.89 million and 2.77 million tonnes in 2007 and 2008 respectively. The value in 2007 and 2008 was JPY 1 637 billion and JPY 1 570 billion respectively. In 2007, shrimp and prawn had the largest value among imported fishery products, followed by tuna and tuna-like species, salmon and trout and crab. Currently, China is the largest source for Japanese imports of fishery products.

Japan's export of fish and fish products is significantly smaller than its imports of fish and fish products. In 2008, the quantity of exports was 0.52 million tonnes, an increase of 0.24 million from the level in 1998. In 2008, the value of exports was JPY 209 billion, an increase of JPY 56 billion from that in 1998. The level of increase both in quantity and value in current year is remarkable compared to those of past years. This positive trend is confirms the growing international reputation of Japanese food as well as the economic development of several Asian nations.

In August 2006, Japan ratified the United Nations Fish Stock Agreement (UNFSA), which complements the provisions of UNCLOS with respect to the management of straddling stocks and highly migratory species. In July 2008, Japan accepted the Convention for the Strengthening of the Inter-American Tropical Tuna Commission established by the 1949 Convention between the United States of America and the Republic of Costa Rica (Antigua Convention). The Antigua Convention is expected to enter into force in the near future to replace existing 1949 IATTC Convention. However, these actions by Japan did not require substantial modification of its fishery policy because most of the elements of these international agreements were already internalised.

To promote international co-operation in resource management, Japan has prohibited the import of Atlantic bluefin tuna from certain countries identified as diminishing the effectiveness of the conservation and management measures of ICCAT, in accordance with ICCAT recommendations. Nevertheless, a large amount of tuna caught by IUU or flag of convenience (FOC) vessels is still imported to Japan, circumventing these international measures, which consequently encourages inappropriate fishing operations. The Government of Japan instituted a requirement for tuna importers to report the name of the fishing vessel upon importing tuna into Japan in accordance with the provision of the Law Concerning Special Measures to Strengthen Conservation and Management of Tuna Resources since 1999. The Government also requested importers to refrain from importing any fish caught by FOC fishing vessels. These are the measures that Japan is taking against FOC fishing operations.

Outlook

Japanese fisheries are faced with falling production, partly due to the fish stock status in Japanese waters and to decreasing numbers and further ageing of fishers. Taking into account other socio-economic factors surrounding fishing and the related industry that are not always favourable for primary industries in developed nations it is clear that Japan's fishery is at a turning point.

At the same time, the future of Japan's fishery is not only pessimistic. Efforts for the recovery of fishery resources and the conservation of natural environments for sustainability fisheries are strengthened. There is further potential for the expansion of exports from Japanese, in addition to a firm domestic demand for fish and fish products. Further attempts are made to make fishing operations more cost- energy- and labour- efficient and to add value to the products. These facts suggest that fisheries continue to be a viable economic opportunity in Japan. The achievement of sustainable fisheries, supported through adequate public policies, benefits not only coastal communities but contributes to the welfare of the entire Japanese nation.

PART III

Chapter 17

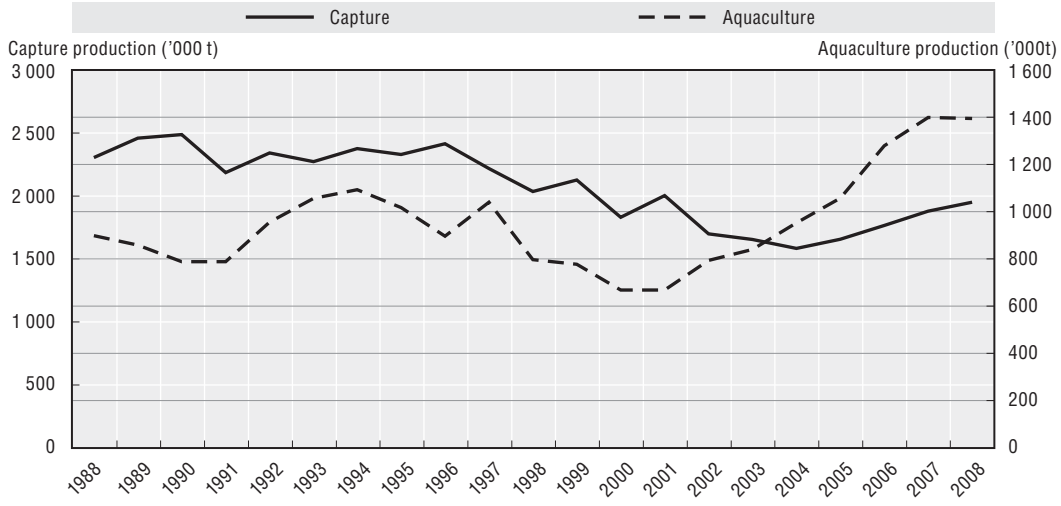
Korea

Korea

Summary of recent developments

- The total fisheries production in 2009 was 3.182 million metric tonnes, a decrease of 208 113 MT (–6.1%) from 3.390 million MT in 2008. This was due to marginal decreases in production in all sectors. The value of the fisheries production in 2009 was KRW 6.9242 trillion, an increase of KRW 579.1 billion from KRW 6.345 trillion in 2008.
- During the last decade, as part of the effort to build a fisheries management system for sustainable fisheries, the government has introduced the Total Allowable Catch (TAC) system, the Community-based Fisheries Management (CBFM) scheme and relevant policies to recover fish stocks. The TAC system was applied to seven species in 2001 after a trial period of two years. In 2009, the system was extended to 11 species. Since the CBFM scheme was implemented in 2001, 758 communities and an estimated 56 000 fishermen have been participating.
- Fish stock recovery policies, in particular the Fish Stock Rebuilding Plan (FSRP), combined with conventional measures were adopted in 2005 with the purposes of maintaining the optimal levels of fish stocks based on the ecosystem and promoting sustainable utilisation of fisheries resources. By 2009, 12 species were included in this stock recovery plan, which so far has had very good results.
- The vessel buy-back programme, in operation since 1994, hass seen a total of 15 399 fishing vessels scrapped.
- These efforts have led to an increase of Catch per Unit Effort (CPUE), a stock indicator, since 2000 and the catch per vessel horse power has been recovering since 2003.

Harvesting and aquaculture production (tonnes)

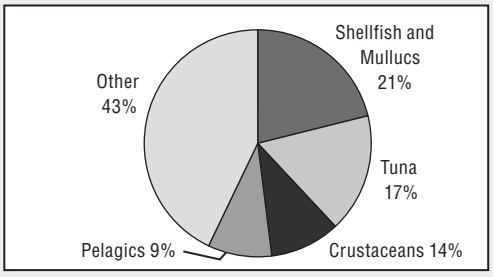


Source: FAO FishStat Database.

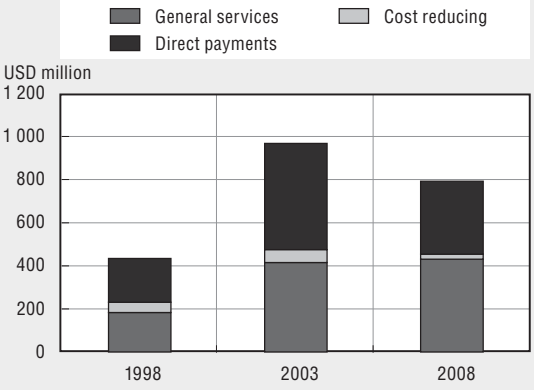
Key characteristics of the sector

- The single most important species landed in 2008 in terms of value were shellfish and molluscs (21%), followed by tuna (17%), crustaceans (14%), and pelagic (9%).
- A total of KRW 720.6 billion was transferred to the fisheries sector in 2009, a decrease of KRW 247.6 billion (25.6%) from KRW 968.2 billion in 2008. Most of the transfers in 2009 were used to improve fisheries infrastructure, such as improving fishing ports (KRW 266.8 billion, 37%) and improving fishery resources (KRW 67.5 billion, 9.4%).
- The total export value of fisheries products in 2009 was USD 1.511 billion (652 214 MT). Exports were mainly to Japan, the United States, and China. The total import value of fisheries products was USD 2.895 billion (4 080 425 MT). Imports were mainly from China, Russia, and Viet Nam.
- A fleet reduction programme known as the "vessel buy-back programme" was implemented in 1994 to address chronic overexploitation of fisheries resources. Since then, a total of 15 399 fishing vessels have been scrapped. The total tonnage of the fleet declined by 32.7% between 2000 and 2008.

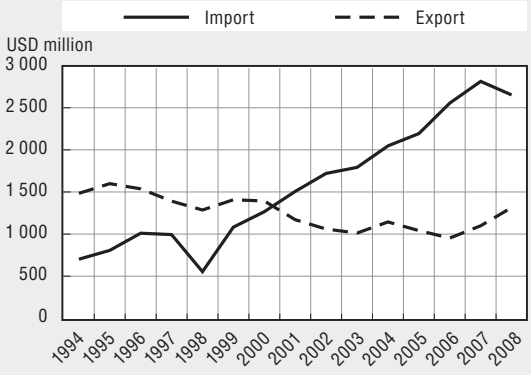
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	94 387	84 010	–11.0
Number of fish farmers	45 450	42 858	–5.7
Total number of vessels	95 890	80 766	–15.8
Total tonnage of the fleet	923 099	621 336	–32.7

Legal and institutional framework

Korea's fisheries management is based on the Fisheries Act, together with many related acts and regulations. According to the Act, the Ministry for Food, Agriculture, Forestry and Fisheries (MIFAFF) has competence over matters with regard to fishing vessels in offshore and coastal waters, and foreign-flagged vessels fishing within the Korean EEZ, while governments at provincial and city levels handle issues relating to fishing licenses of vessels operating in coastal areas.

Fisheries resources have been protected mainly through regulations; for example, the mesh size of fishing nets, fishing grounds, and fishing seasons. The Total Allowable Catch (TAC) system was introduced in 1999 and has been applied to 11 species since 2009.

The Korean government also started a fishermen-led Community-based Fisheries Management (CBFM) in 2011 for more effective implementation of responsible fisheries. This scheme encourages fishermen to voluntarily participate in the management of fishing grounds and resources rather than passively follow the government's fishery resource management scheme. Under this system, fisher organisations such as National Federation of Fisheries Co-operatives (NFFC) and fishers groups at the village level set up their own rules and regulations to control their operations. These are in line with relevant fisheries-related laws and regulations with the endorsement of the local government. The CBFM is designed to give a greater sense of responsibility to the fishermen and to prevent illegal fishing.

With the revision and proclamation of the Fishery Resource Management Act on 17 May 2010, the government plans to establish the Fisheries Resource Development Agency by 1 January 2011, which will be in full charge of fisheries resources management and development. The Fisheries Resource Development Agency will promote the implementation of stock enhancement programmes (artificial reefs, marine ranches, seaweeds forest and fish seed release, etc.) and research programmes (technology development, stock enhancement model design, ecosystem research, TAC-related research, and climate change-related studies). The agency will also facilitate the use of fisheries and marine resources by branding fisheries products and promoting marine leisure and tourism; it will also conduct other relevant work commissioned by the central and local governments.

In June 2001, both the Korea-China Fisheries Agreement and the Korea-Japan Fisheries Agreement entered into force. According to these bilateral agreements, only Chinese and Japanese vessels have access to the Korean EEZs on a reciprocal basis.

To fulfil its obligation as a responsible fishing nation on high seas, the Distant Water Fishery Act was legislated in 2007. It provides a legal basis to comply with conservation and management measures of international fishery organisations. In addition, Korea became the 68th party to the United Nations Fish Stock Agreement by depositing a letter of accession in February 2008.

Capture fisheries

Performance

The total catches from coastal and offshore, distant waters, and inland fisheries was 1.87 million MT (valued at KRW 5.0779 trillion) in 2009, a small decrease of 111 000 MT (–5.6%) but an increase in value of 253 million (–5.2%) from 1.98 million MT (KRW 4.825 trillion) in 2008. In coastal and offshore fisheries, the production in 2009 totalled at 1.23 million MT, a decrease from 2008 (1.29 million MT). The major species in coastal and

offshore fisheries were anchovy, squid, mackerel, and hairtail. In particular, the catch of anchovy, which accounts for the largest proportion of the total catch, amounted to 203 728 MT in 2009, a 22.1% decrease from 261 531 MT in 2008. The production of mackerel was 175 329 MT, a 7.9% decrease from 190 456 MT. The production of squid was 189 160 MT in 2009, an increase of 1.6% from 186 160 MT in 2008.

In distant water fisheries, production in 2009 totalled 612 000 MT, a decrease of 8.1% from 666 000 MT in 2008. The number of fisheries households dropped by 2%, from 71 046 in 2008 to 69 379 in 2009. The number of fisheries households in 2008 can be categorised by 30 569 (44.1%) households with fishing vessels, 16 218 (23.3%) without fishing vessels, and 22 592 (31.2%) engaged in aquaculture.

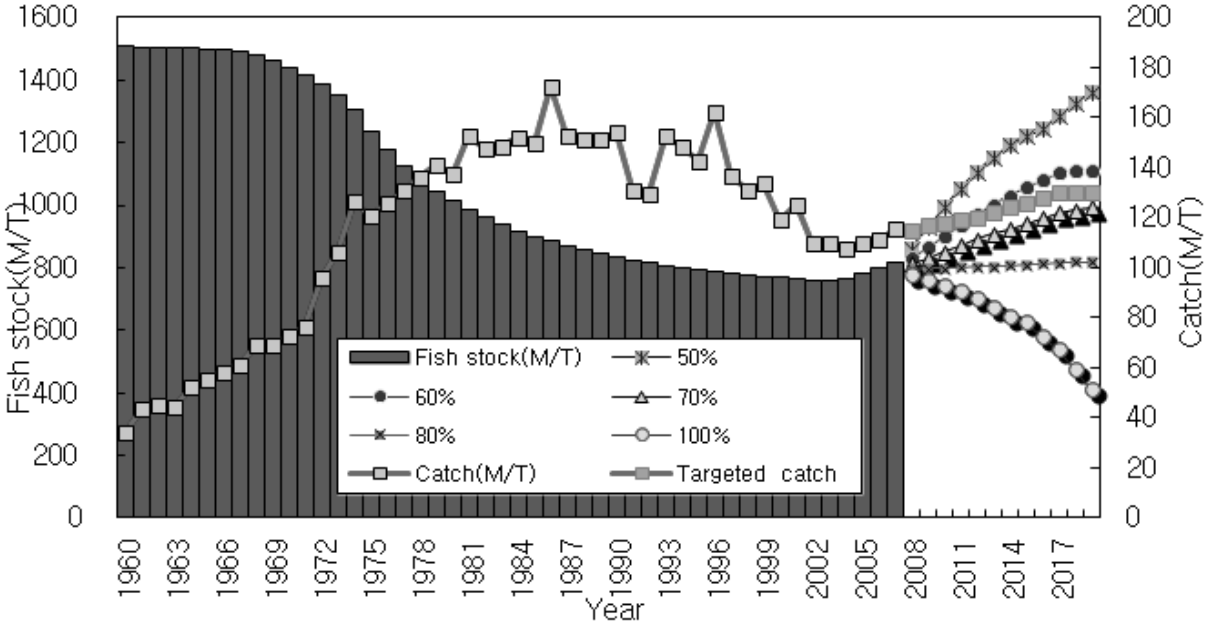
The number of fishing vessels decreased by 3 063 in 2009; from 80 766 vessels (621 338 GT) in 2008 to 77 713 vessels (594 772 GT). The decrease in number and gross tonnage is a result of the government's fleet reduction programme.

Status of fish stocks

Reaching a record high in the mid-1980s at 1.7 million MT, fishery production in coastal and offshore waters had decreased to 1.08 million MT by 2004, but increased to 1.1 million MT in 2005. The trend continued in 2008 with production increasing to 1.29 million MT.

Overall, the pelagic stocks such as Alaska Pollack are on the decline, but the number of hairtails, yellow corvine and herrings is increasing. Catch per Unit Effort (CPUE), a stock indicator, has been increasing since 2000 and catch per vessel horse power has been on the recovery since 2003. In particular, the production of 12 species targeted under the resource recovery system was 203 000 MT, an increase of 21.3% from 2008. The Korean government achieved the desired results.

Figure 17.1. **Trends and prediction of fish stocks and catch**



Management of commercial fisheries

Management instruments

Major management tools taken for coastal and offshore fisheries include: maximum number of fishers to be licensed; minimum mesh size of nets; regulation on fishing grounds; fishing seasons and size of fish, etc.

A TAC system has been in operation for 11 species after the 1999-2000 trial periods, which then covered four species (mackerel, sardines, jack mackerel, red snow crabs) (Table 17.1). To ensure the compliance with the TAC system, observers are dispatched to fishing vessels to check the amount and weight of catches at landing and to collect biological data of the catches. The Korean Government will gradually expand the number of species covered by the TAC system in order to manage fisheries on the basis of high-quality scientific data and for sustainable fisheries.

Table 17.1. **TACs and catches in 2009**

Species	TAC (MT)	Catch (MT)
Mackerel	159 000	148 589
Jack mackerel	18 000	16 044
Red snow crab	29 000	28 845
Snow crab	1 400	821
Purplish Washington clam	1 700	1 694
Pen shell	3 100	2 792
Cheju top shell	1 320	1 291
Blue crab	7 380	6 803
Japanese flying squid	185 000	141 257
Arctoscopus japonicus	1 500	923
Raja pulchra	200	143
Total	**381 930**	**266 975**

To effectively implement responsible fisheries, MIFAFF introduced fishermen-oriented CBFM in 2001, under which 758 fishing villages were registered as of 2009. Through this system, fishery management focuses on preventing illegal fishing and overexploitation of fisheries resources, and on stabilising the income of fishers.

Access arrangements for foreign fleets

Table 17.2 presents the bilateral fisheries agreements between Korea and foreign countries and the status of fishing access to foreign waters. Currently, Japan and China are the only foreign countries allowed to fish in Korean waters.

Management of recreational fisheries

Currently, leisure fishing takes up the largest part in Korea's recreational fisheries. Management of leisure fishing in Korea was confined to recreational fishing vessels according to the Recreational Fishing Vessel Act, inland fishing spots through the Inland Fishing Act, leisure fishing spots based on the Fisheries Law and thus the scope has been inadequate to address the big picture. Therefore, many voices have been raised for the government to develop comprehensive and effective management measures for recreational fishing activities.

Table 17.2. **Korea's bilateral fisheries agreements and access to foreign waters**

	Date of implementation of agreement	Targeted fish species
Japan	22 January 1999	Mackerel, squid
China	30 June 2001	Hair tail, croaker
Tuvalu	18 June 1980	Tuna
Solomon Islands	12 December 1980	Tuna
Kiribati	18 December 1980	Tuna
Russia	22 October 1991	Alaska pollock, saury, cod, squid
Papua New Guinea	15 April 1992	Tuna

Table 17.3. **Present status of leisure fishing management**

Category	Present status (2009)		Related laws	Note
Recreational fishing vessel	3 881 ships		Recreational Fishing Vessel Act	
Inland leisure fishing spots	Total	1 021 (places)	Inland Fishing Act	In public water surface case of it should be registered, in private water surface case of it should be permitted
	Permission	498		
	Register	211		
	No permission	312		
Leisure fishing spots	148 places		Fisheries Law	

Since 2009, there have been a number of processes to legislate the Recreational Fishing Management and Promotion Act to address various problems, including overexploitation of fisheries resources, environmental pollution, and safety issues that arise from the growing trend of leisure fishing activities. The objectives of the Recreational Fishing Management and Promotion Act go beyond simply regulating leisure fishing activities. It also reflects the Korean government's intention to raise people's awareness on sustainable leisure fishing and to develop the leisure fishing industry as a new engine of growth, and thereby contribute to the growth of Korea's fisheries.

Monitoring and enforcement

Monitoring and enforcement measures to implement fisheries-related regulations are implemented by the MIFAFF, the Korean Coast Guard, and local governments. As of 2007, there were 110 fishery guidance vessels, 269 patrol ships, 15 helicopters, one airplane and 6 458 personnel involved in monitoring and enforcement activities. Notably, a special law was enacted in 2004 to root out illegal fishing by small bottom-trawl boats and, consequently, a total of 2 467 boats were decommissioned between 2005 and 2006. The number of reported illegal fishing incidents in 2007 was reported to be 3 773, a 25% increase from 3 015 in 2006.

Multilateral agreements and arrangements

Korea became the 68th party to the United Nations Fish Stock Agreement in February 2008 and is currently participating in 16 international fisheries organisations such as ICCAT, CCSBT, IWC, IATTC and WCPFC.

Aquaculture

Policy changes

The culture-based Fishery Promotion Act was established on 14 January 2002. In accordance with this Act, the government set up a five-year basic plan to promote culture-based fisheries. In addition, the Aquatic Animal Disease Management Act was legislated on 21 December 2007 in order to establish an efficient response system to cultivated fish diseases and to ensure the safety of imported fishery products.

As part of the efforts to promote sustainable and responsible fisheries development and an ecosystem-based aquaculture management, the Korean Government is taking measures to encourage environment-friendly offshore aquaculture as opposed to inland aquaculture.

In 2009, the Plans to Promote Eco-Friendly and High Valued Added Offshore Fisheries was developed. It aims to establish six areas for offshore aqua farms (four bluefin tuna farms, two for other species) and to lay the R&D foundation for "complete tuna farming", which encompasses the entire life cycle of tuna.

Size of aquaculture facilities, values and volumes

The area devoted to aquaculture in 2009 was 138 867 hectares, an increase of 3 784 ha (2.8%) from 136 083 ha in 2008. Aquaculture production in 2009 was 1 313 000 MT (KRW 1 846 300 million), a 4.9% decrease from 1 381 000 MT (KRW 1 502 100 million) in 2008. The number of aquaculture households in 2009 was 22 592, a 2.2% increase from 22 101 in 2008. The major species in aquaculture are flatfish, jacopever, oyster, short-necked clam, sea mussel, laver, and brown seaweed.

Fisheries and the environment

To assess the environmental impacts on fisheries and the environmental capacity for sustainable fisheries, various factors such as water quality, sediments, distribution of benthos, and the status of the use of fishing grounds are being studied.

The Korean Government has also been operating an effective system to provide early warning forecasts for red tides so as to mitigate the damage they cause to coastal and offshore fisheries and aquaculture.

In addition, 206 500 hectares of artificial reef were created by 2009 as a result of an artificial reef project to restore fishery resources in an environment-friendly manner.

The quality seedling/releasing project has been implemented since 1986; a total of 1 150 million seedlings for flatfish, jacopever and abalone had been released by 2009. Korea is investing KRW 158.9 billion until 2010 to foster sea-ranches that are designed for specific areas along the coast line.

The Fisheries Resources Development Agency, to be established in January 2011, will enable the efficient implementation of stock enhancement programmes such as artificial reef, seaweeds forest, marine ranches and fish seed release. So far, the government has designated and is managing 2 979 km^2 (measured by sea levels) in ten bays (in which are found 21 cities and districts) under the Fisheries Resources Protective Areas in order to conserve coastal ecosystems, spawning areas and habitats.

Government financial transfers

Budget transfer policies

A total of KRW 720.6 billion was transferred to the fisheries sector in 2009, which is a decrease of 247.6 billion from 968.2 billion in 2008. Among the KRW 720.6 billion, KRW 624.9 billion was transferred to the marine capture sector, KRW 24.4 billion to the aquaculture sector, and KRW 71.3 billion to the distribution and processing sectors. Most transfers in 2009 were used to improve fisheries infrastructure such as improving fishing ports (KRW 266.8 billion, 37%) and improving fishery resources (KRW 67.5 billion, 9.4%).

Structural adjustment

A total of KRW 129.6 billion was transferred to the decommissioning programme that restructures coastal and offshore fleets.

Post-harvesting policies and practices

Policy changes

Food safety and labeling

To ensure that seafood is safe and meets international quality standards, the Hazard Analysis Critical Control Point (HACCP) system has been introduced in accordance with the Standard of HACCP in Fishery Products, which was established in 2003.

The government introduced a traceability system on a trial basis in 2005. The purpose is to provide consumers with information regarding the records traced from vessel to table. In August 2008, legislation was passed to expand the application of this system and at present 14 items are covered by this system.

Processing and handling facilities

Various factors such as the perception that seafood is healthy and consumers' ongoing pursuit of convenient foods are increasing the consumption of processed sea food. As a result, the total number of processed fisheries products in 2009 increased to 1.9 million tonnes from 1.77 million tonnes in 2008. The Korean Government is planning to develop the processing industries by building processing facilities adjacent to places of origin to meet the diversified and sophisticated consumer demands.

Markets and trade

Markets

The total supplies to the Korean fisheries market in 2008 was 6.12 million MT. In terms of supply, the total production reached 3.362 million MT (55%) while imports recorded 2.14 million MT (34.9%).

With regard to demand, the domestic consumption recorded 4.28 million MT (70%) while exports showed 1.27 million MT (20.7%).

The per capita consumption of fisheries products rose to 55 kg in 2007, an increase of 1.5% from the previous year.

Trade

Exports of fisheries products were USD 1 511 million (652 000 MT) in 2009, an increase of 3.9% from 2008 due to increasing exports to Japan. Imports of fishery products

Table 17.4. **Trends of supply and demand for fishery products ('000 tonnes)**

Category	2003	2004	2005	2006	2007	2008
Supply						
Production	2 486	2 519	2 714	3 032	3 271	3 362
Import	2 268	2 477	2 557	2 646	2 604	2 135
Carry over from the previous year	769	573	531	512	575	618
Total	**5 523**	**5 569**	**5 802**	**6 190**	**6 450**	**6 115**
Demand						
Consumption	3 578	3 922	4 169	4 568	4 621	4 282
Export	1 202	1 116	1 121	1 047	1 211	1 266
Carry over to next year	743	531	512	575	618	567

Table 17.5. **Per capita consumption trend of fisheries product (%)**

	2002	2003	2004	2005	2006	2007
Total (kg/year)	**44.7**	**44.9**	**49.0**	**48.1**	**54.2**	**55.0**
Fish and shellfish	36.3	38.5	41.1	38.5	41.2	40.6
Seaweed	8.4	6.4	7.9	9.6	13.0	14.4

Source: Korea Rural Economic Institute.

in 2009 decreased by 6.4% in value to USD 2.895 billion (4.08 million MT) from 2008 due to decreasing imports from China and Japan.

The leading export items were tuna, squid, flounder, and oysters, and main import items were Alaska Pollock, shrimp, small octopus, yellow corvine and hairtail. Korea's main exporting countries were Japan (48.6%), China (9.6%), and the United States (8.5%), and the leading importing countries were China (29.5%), Russia (15.0%), and Viet Nam (10.5%).

Korea concluded Free Trade Agreements with Chile, Singapore, EFTA, ASEAN and India. FTAs have been completed or signed with the United States, Peru and the European Union and many more FTAs are being negotiated with Canada, Mexico, GCC, Australia, New Zealand, Colombia and Turkey. These FTAs are expected to contribute to expanding the fishery trade among contracting parties.

Outlook

The primary objective of the fisheries policies is to improve both fishers' and consumers' welfare by protecting and recovering fisheries resources. For fishers, the government focuses on the following: *a)* facilitation of the fishing fleet buy-back programme; *b)* promotion of efforts to foster culture-based fisheries and fishery resources; *c)* expansion of applicable species for the TAC system and Fish Stock Recovery Programme; *d)* amendment of fishery-related institutional regimes to harmonise with the fishermen-oriented CBFM; and *e)* strengthening law enforcement activities to eliminate illegal fishing activities.

To protect consumers, the Korean Government will emphasise the quality of fisheries products, reinforce rules and regulations relating to seafood sanitation including the broad application of the HACCP system, and devise a better system to avoid any unnecessary competition in fishery markets.

The government will encourage tourism projects linking fishing villages, fishing ports, and fisheries resources to boost the incomes for fishers.

Along with such efforts, Korea will do its utmost to adapt itself to the ever-changing fishing environment and participate in international efforts for the optimum management and sustainable use of marine resources.

The Korean Government is also making efforts to deal with the impact of climate change on the fisheries sector. This sector is going through environment-induced challenges such as changing distribution and abundance of major species, the appearance of sub-tropical species, and toxic jellyfish. In response, the government takes climate change seriously into consideration in terms of fisheries management which is reflected in the Comprehensive Marine and Fisheries Strategies for Climate Change (2007) and the National Action Plan to Adapt to Climate Change (2009).

PART III

Chapter 18

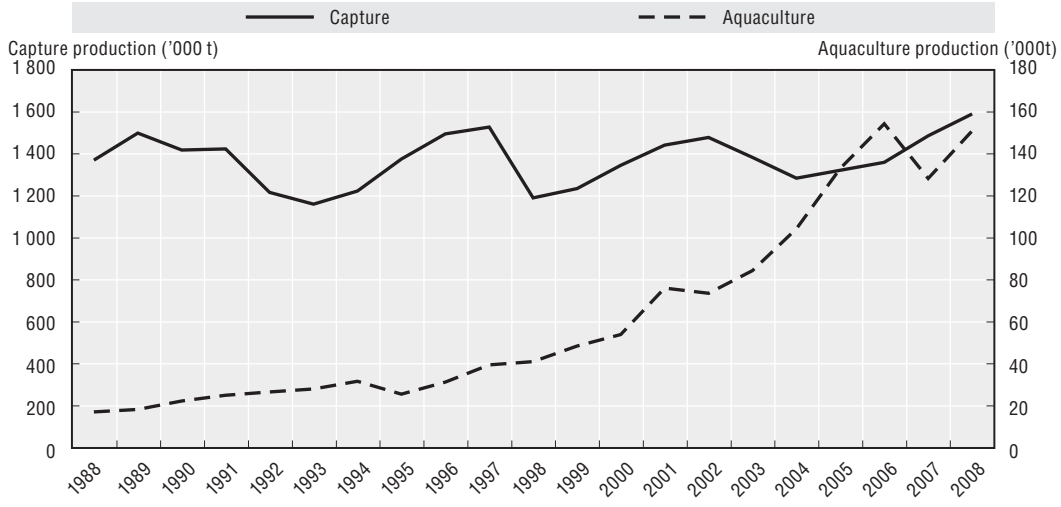
Mexico

Mexico

Summary of recent developments

- The fisheries sector is a very important economic contributor, as well as an important source of nutrition for the Mexican population. It supports the fisheries processing sector and is a foreign currency earner that contributes to a positive trade balance due to its high value-added products. Fishing provides an important income source for local communities and contributes to their regional economic development.
- Mexico has productive fisheries for marine and inland waters with great species biodiversity. Furthermore, aquaculture production has good potential for growth.
- Mexican fisheries policy is focused on improving the competitiveness of the sector. An economic strategy has been put in place by the Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA) through its National Plan of Development and the National Rector Programme of Fisheries and Aquaculture. The purpose of these plans is to improve the global process of integration into international markets.

Harvesting and aquaculture production (tonnes)

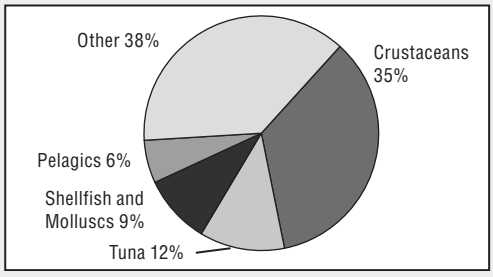


Source: FAO FishStat Database.

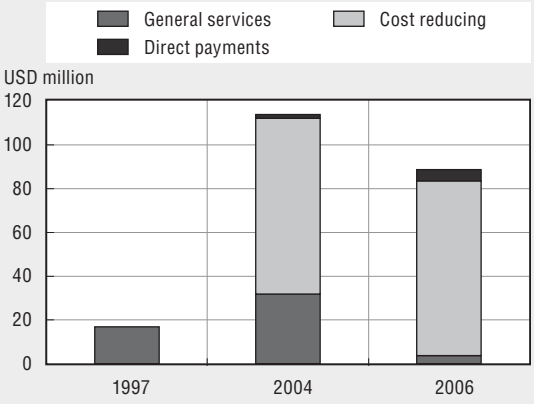
Key characteristics of the sector

- The most important species landed in 2008 in terms of value were crustaceans (35%) followed by tuna (12%), shellfish and molluscs (9%), and pelagic fish (6%).
- A total of USD 89 million were transferred to the fisheries sector in 2006. This represents a decrease of USD 25.2 million or (22.1%), compared to that of 2004. Cost-reducing transfers made up about 90% of all transfers in 2006.
- The total export value of fisheries products was USD 827 million in 2008, with the United States, Japan and Spain as the main export destinations. The total import value of fisheries products amounted to USD 588 million in 2008.
- The total number of fishers and vessels in 2008 has remained stable since 2000. However, the number of aquaculture operations has increased substantially (66%) since 2000. This upsurge is associated with a sharp increase (180%) in aquaculture production over the same period.

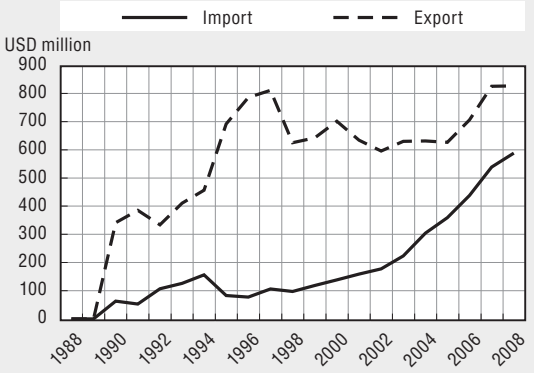
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	244 131	243 452	–0.3
Number of fish farmers	18 270	30 332	66.0
Total number of vessels	106 373	106 205	–0.2
Total tonnage of fleets	231 762	n.a.	n.a.

Legal and institutional framework

The National Commission for Aquaculture and Fisheries (CONAPESCA) is a decentralised federal body of SAGARPA, in charge of managing the fisheries and aquaculture resources of the country. This responsibility is shared with state governments and municipalities.

The main legal instruments with respect to fisheries and aquaculture activities are as follows:

- the Political Constitution of the United Mexican States;
- the General Fishing Law for Sustainable Fisheries and Aquaculture and its Regulations;
- the Organic Law of Public Administration;
- the Regulation of the SAGARPA, closed seasons regulations and the operation rules of the SAGARPA programme (published on the Official Gazette on 31 December 2001);
- creation decree of CONAPESCA (published on the Official Gazette on 5 June 2001); and
- the Official Mexican Standards (NOM's) and the Fishery National Charter.

Fishing activity and all activities involving live marine resources for self-consumption, research, and commerce are regulated under Article 27 of The Political Constitution of the United Mexican States, and by The General Fishing Law for Sustainable Fisheries and Aquaculture, published in the Official Gazette on 24 June 2007.

In 2007, the General Fishing Law for Sustainable Fisheries and Aquaculture was established (hereinafter, the Law). It is designed to improve the legal framework to ensure fishery resources conservation, combined with rational exploitation, and utilisation. This law provides a framework for coordination between institutions and defines the responsibilities of the federal, states and municipal governments.

The Law establishes the fishery and aquaculture sector as a priority for Mexico's development. The Law is intended to protect the aquatic flora and fauna in a sustainable long term vision. It establishes the Mexican Fund for the Fishery and Aquaculture Development (PROMAR) to promote and increase the sustainable development of aquaculture and fishery resources. Scientific and technology research are identified as inputs to public policy and for implementing mechanisms to protect aquatic resources.

The Law recognises aquaculture as a means to take pressure off of fish stocks and to promote aquaculture as an important source of food and employment. It also regulates sport fishing, an important source of employment in the tourist sector.

Other instruments considered in the Law are a sustainable fishing programme and fisheries policy instruments including concessions and permits. Fish products from capture and aquaculture in federal waters are managed through permits and concessions. Permits are issued for a period of two to five years. Concessions to capture fishery species are issued for a period of 5 to 20 years and for up to 50 years for aquaculture. Absolute control is granted to Mexican-flagged vessels as well as vessels arriving in Mexican ports.

The National Fishery Charter reports on fishery products availability and conservation, and it is used as part of the decision-making process for management and conservation. It includes information on species in inland waters, EEZ, lagoons, etc., and associated species to promote a special protection.

Producers must comply with provisions contained in the Official Mexican Standards, NOMs, which establishes terms and conditions for different species. The standards specify target species, protected species, fishing seasons, authorised allowable catches, methods

and equipment, operating conditions, minimum sizes and weight, and, where applicable, a fishing quota and verification processes. At present, there are 45 Official Mexican Standards (NOM's): 17 for marine fishing grounds, 22 for continental waters, and six related to sport fishing, sanitation (3), vessel monitoring system (VMS for satellite monitoring), and technical specifications of Turtle Exclusion Devices (TEDs).

Capture fisheries

Performance

Mexico was the world's 15th largest producer of fish in 2008, representing 1.1% of the world total. The fishing production in 2009 was 1.768 million tonnes, an increase of 1.3% or 22 000 tonnes over 2008. Production has shown a slight upward trend in recent years due to increases in aquaculture production.

Status of fish stocks

Sardine stocks are utilised at their maximum sustainable level. This fishery is mainly concentrated in the states of Baja California, Baja California Sur and Sonora. Sardine was the most important species in 2009 with a volume of 872 640 tonnes, 49.3% of the national production. It is regulated through commercial permits for small pelagic capture, with authorised fishing gears and in specified zones. Mexico is working towards implementing actions to reduce fishing efforts and to apply the precautionary principle.

In 2009, shrimp ranked second in volume and first in value, with a production of 196 000 tonnes. The shrimp fishery is concentrated in the Pacific Ocean and the Gulf of Mexico; facing the states of Tamaulipas and Campeche. The fishery as a whole is considered to be utilised at its maximum sustainable level. Mexico aims to maintain the current fishing effort and continues with research into Turtle Excluder Devices (TEDs) to reduce incidental catches. The fishing season is set by the proper authority. The shrimp fishery has one of the most complete management and research schemes in Mexico.

The tuna fishery takes place in jurisdictional waters both near shore and on international waters. The tuna fishery is the second largest fishery, both in volume after sardine and in value after shrimp. Mexico became the second largest exporter of fresh bluefin tuna to Japan after increased production by ranches dedicated to mariculture on the coast of Baja California. Yellowfin tuna is utilised to its maximum sustainable use, but bigeye and skipjack are utilised above Maximum Sustainable Yield (MSY). Season closures for yellowfin tuna and bigeye have been put in place in order to reach MSY.

The oyster fishery is fully utilised and has two closed seasons to protect it during recruitment. The Mexican government seeks to maintain current fishing efforts, while at the same time increasing the amount of permits issued. The clam fishery takes place on the shores of the Pacific Ocean and in the state of Veracruz. The resource is depleted in Baja California Sur and three other states. Management in Baja California Sur is based on quotas.

The shark capture areas are the Pacific Ocean, the Gulf of Mexico, and the Caribbean Ocean; all are utilised at their maximum sustainable level. Since 1993, no permits have been issued to capture shark, except when vessels are replaced or permits are renewed as a means to maintain current fishing efforts.

The crab capture zones are costal lagoons and marine sea waters. Current capture shows a growing trend and thereby showing development potential.

Management of commercial fisheries

Management instruments

Commercial fishing in the Economic Exclusive Zone (EEZ) of Mexico is managed through a system of permits and concessions. Harvesting is controlled by limiting the number of permits issued combined, when necessary, with permanent or temporarily closed seasons. These limitations are complemented with technical regulations, such as minimum capture sizes and mesh sizes.

During the 2008-09 period, the focus was on effort reduction by limiting the number of authorised vessels, restrictions on environmentally harmful practices, implementation of capture quotas for certain species, protected areas, temporary closed seasons, minimum sizes, and provisions regulating fishing gears and incidental capture.

Artisanal fishing was promoted through individual permits per fisher and vessel of the same organisation to improve inspection and surveillance actions. There have been ambitious efforts to improve the measurement and associate actual fishing efforts with the registration of vessels.

In 2006 and 2007, temporary closed-season agreements were implemented for all shrimp species in sea waters, lagoons, bays and estuaries of the Pacific Ocean, the Gulf of California, and the Caribbean Sea. The Pacific Ocean Shrimp Fishery Management Plan was published. For 2009-10, a catch quota system was implemented in the states of Sinaloa and the south of Sonora.

Official Mexican Standards (NOMs) were reviewed and updated with respect to gear and effort restrictions. The main objective was to improve gear selectivity to reduce by-catch and to improve the fishery resources conservation, habitats and ecosystems.

As regards fleet capacity, the Support for Fishing Effort Reduction Programme has been implemented to reduce the fishing effort. Until 2009, 400 boats were voluntarily retired and 188 by administrative withdrawal, with an investment of MXN 555.3 million. Three hundred and six shrimp vessels have been removed with an investment of MXN 1 million per vessel.

The Inter American Tropical Tuna Commission (IATTC) has joint provisions regarding a multi-year programme for tuna conservation affecting the Mexican tuna fleet operating in the Pacific Ocean. The provisions by regional organisations do not always require changes in Mexican legislation, but are nonetheless mandatory in Mexico.

Access arrangements for foreign fleets

The Mexico and Cuba Fishing Agreement is currently the only foreign agreement in effect. Since July 1976, Cuban vessels have been authorised to operate in the Gulf of Mexico and the Caribbean EEZ. The number of Cuban Vessels operating in the EEZ of Mexico has been reduced due to declining fish stocks and the increased capacity of Mexican vessels. The quota and the average number of authorised permits in the last years represented only 3% and 18.2% of 1976 levels. Cuban vessels are required to be part of the Satellite Monitoring Programme in Mexico.

Management of recreational fisheries

The National Commission for Aquaculture and Fisheries, CONAPESCA is responsible for evaluating and administering the sport fishery according to the Law. Sport fishing is subject to gear and location restrictions. Six migratory species are reserved for sport

fishing. Maximum capture limits, capture size and weight per zone are established according to research codified in NOM-017-PESC-1994.

To strengthen sport fishing, the National Programme of Sport Fishing 2008-12 was implemented by CONAPESCA. This aimed to achieve rational and sustainable resource utilisation by the following means:

- promoting Mexican sport fishing nationally and internationally;
- achieving an integrated and sustainable administration for Mexican sport fishing, through biological research projects for relevant species;
- improving institutional performance related to sport fishing activities;
- incorporating a new legal framework to promote the development of sport fishing.

This programme was produced with the participation of the National Federation of Sport Fishing. Sports fishing in Mexico is an important part of tourism and sport activities; more than 50% of world records registered by the International Game Fish Association (IGFA) are in Mexico. Sport Fishing generates 30 000 direct jobs and 16 000 fishing vessels are registered in this activity. In addition, 18 000 foreign sport fishing vessels operate in Mexico.

Aboriginal fisheries

The Seri people traditionally live along the state of Sonora´s central shore, on Tiburon Island and other islands nearby; they also currently inhabit two places in the Sonora desert area. Depending on fishing cycles, they move between different fishery camps along their territory. Their rights are mainly linked to puberty initiation, of which turtle meat is a fundamental part. For this reason, a minimum marine turtle capture is authorised for indigenous traditions.

Monitoring and enforcement

CONAPESCA maintains a mandatory National Fishing Registry for those who are engaged in activities for which they hold licenses, permits or authorisations. The National Commission for Aquaculture and Fisheries is in charge of inspection and surveillance of fishing resources. The Law and its regulations referring to fishery monitoring and surveillance are implemented by Inspection and Surveillance States Committees. These Committees act as planning, execution and evaluation agencies to fight illegal fishing, according to the Integral Programme of Inspection and Surveillance. There are also other laws which have direct impact on fishing activities: Navigation Law, Ports Act, the Constitution of the United Mexican States, Ecology Balance and Environment Protection General Law.

Mexico has reinforced monitoring, control and surveillance through the following actions:

- greater control of permits and concessions granting;
- selecting and updating the Fishing National Registration vessels inventory;
- strengthening verification of the legal origin of fisheries products at port;
- increasing inspection and surveillance in national waters;
- implementing the Satellite Monitoring System in 2005 – so far, a total of 2 042 devices (VMS) have been installed on both coasts (1 112 in the Pacific Ocean and 924 in the Gulf of Mexico);
- the on-going Observers programme;
- fishing guide implementation: this is an auxiliary tool for fishing inspection and surveillance, in order to prevent illegal fishing and fisheries products transportation;

- increased participation in international and regional organisations promoting regulations to strengthen the International MCS Network, FAO (IUU Plan), IATTC, and ICCAT among others;
- bilateral agreement with Cuba on satellite devices use on Cuban fleet in Mexican waters;
- promoting a "sustainability culture", as well as honesty and professionalism among fisheries inspectors through the General Bureau of Inspection and Surveillance of the National Commission for Aquaculture and Fisheries;
- inclusion of the NOM-062-PESC-2005 as of June 2008 into the Official Mexican Standards to utilise Monitoring Satellite Systems in fishing vessels.

Multilateral agreements and arrangements

Mexico is an active member of the following organisations: The Food and Agriculture Organisation of the United Nations (FAO); The Fisheries Working Group of the Asia-Pacific Economic Cooperation mechanism (APEC), the Latin American Fisheries Development Organisation (OLDEPESCA), the Fisheries Committee of the Organisation for Economic Cooperation and Development (OECD), Consultant and Information Services Center for Fishery Products Marketing in Latin America and the Caribbean (INFOPESCA), Inter-American Tropical Tuna Commission (IATTC), the International Commission for the Conservation of Atlantic Tunas (ICCAT), among others.

Mexico's international fisheries policy promotes the establishment of new relations among countries to have access to new organisations and production systems. Mexico is actively engaged in key international agreements governing the sea and the harvesting of fisheries resources. Mexico is a contracting and active Party to the United Nations Convention of the Law of the Sea (UNCLOS). A Compliance Agreement fully implemented by article VI which facilitates the control of vessels operating in the high seas; the Agreement on the International Programme for the Protection and Conservation of Dolphins.

Mexico is an active member of international and regional organisations. Within the Food and Agriculture Organisation of the United Nations (FAO) and the Fisheries Working Group of the Asia-Pacific Economic Co-operation mechanism (APEC) framework. Mexico has been actively participating in creating an Aquaculture Network in America (ANA). Mexico also performed an evaluation of provisions of the High Seas Agreement at the national and regional level, to make proposals for revisions to facilitate the access for new members.

At the Latin American Organisation for Fisheries Development (OLDEPESCA), Mexico has been supporting the diffusion of eco-labels in fishery products, the development of quality systems to facilitate trade and the creation of the virtual platform of the Aquaculture Iberoamerican Observatory.

Mexico has been participating in the Regional Programme for the Conservation and Co-Ordination of Sharks with the technical and financial support of FAO. In this programme, CONAPESCA has been supporting the formulation of national programme of other OLDEPESCA members. A meeting was held in 2007 to draft a shark strategy with Cuba, Ecuador, Guyana, México, Peru and Venezuela. Additionally, Mexico committed to have a more direct involvement in the activities leading to the final formulation of the regional project for the conservation and management of sharks.

To contribute to the improvement of the seafood supply chain in Central America, a project known as "Improving marketing efficiency of Artisan Fishermen in Central America, Mexico and the Caribbean" was developed, sponsored and supervised by INFOPESCA and the FAO Sub-Committee on Fish Trade. INFOPESCA also developed the

project "Improvement of internal markets of sea products in Latin America and the Caribbean" that concluded in 2009 with a FAO contribution to improve the internal markets of sea products and the professionalism of fishermen and distributors in 11 countries.

The FAO was also involved in the development of a project called "Mexican Fishery Regulations Review Assistance" in which Mexico received expertise assistance for the creation of the Law. In 2009, FAO performed a social fishing study in Mexico to investigate the social problems of the fishers, their environment and their vision about possible solutions to the problems affecting fishing.

Aquaculture

Policy changes

Aquaculture development is one of the priorities of Mexico's fishery policy. Changes in the legal framework have been mainly oriented to promoting development. Aquaculture is seen as an important means to increase the food supply. It contributes to food security, earning foreign currency, adding regional development and reducing pressure on wild coastal stocks.

Shrimp is the main aquaculture product, being 46.76% of total volume and 73.29% of the value for 2009. It is followed by Mojarra at 13.15% of the total value of aquaculture production, trout with 3.95% and tuna with 2.7%. From 1996 to 2009, the annual growth rate in aquaculture has been 3.79%. This rate is expected to slow as shrimp farming matures.

Rural aquaculture is seen to support local communities and improve both subsistence and marketing uses of fish. The objective of the Rural Aquaculture Programme is to develop small-scale investment projects through economic support for producers in poor areas. Support is given to producers to improve basic infrastructure and equipment to improve production levels using efficient technologies, higher yields and quality food products production.

In 2009, CONAPESCA operated and supervised 35 Aquaculture Centres in 23 states. These centres have the objective of improving genetic lines and provide training and technical assistance to producers. The Commission invested MXN 14.2 million in current expenditure and MXN 1.6 billion in staff hired on a fee basis to fund the operation of these centres. During 2009, MXN 5.9 million were distributed to 18 aquaculture centres for capital improvements.

The aquaculture centres produced 32.15 million organisms in 2009. The main species produced were catfish (878 750), carp (9 915 082), bass (206 079), tilapia (19 070 489), trout (1 757 551) and native fish (322 600). These were distributed to all 26 states, benefited 51 699 families, and supported programmes including the Conversion Product and Production System and the Resettlement of Reservoirs.

Fisheries and the environment

Environmental policy changes

In order to limit incidental capture and discards, the National Fishing Institute (INAPESCA) has been working to implement changes in equipment and fishing gear under Experimental Fishing Programmes. In 2007, the NOM-061-PESC-2006 was included in the Official Mexican Standards. It specified the use of Turtle Exclusion Devices (TEDs) that allow marine turtles to escape.

The National Plan of Development, covering the period 2007-12 was developed to establish objectives, strategies and priorities. Environmental viability is included as a means to achieve an efficient and rational administration of natural resources, increase competitiveness and improve economic and social development.

Based on the National Plan of Development and the Vision of Mexico 2030, the Mexican Government has developed the Sectorial Programme of Farming and Fishing of the SAGARPA for 2007-12 which establishes the objectives and goals of government organisations. The Sectoral Programme will develop actions integrating a long term view using performance indicators, to monitor and evaluate goals and outcomes. The main objective is to promote development and improve the competitiveness and transparency of the fishing sector by doing the following:

- increasing the human development of Mexican citizens living in rural and coastal areas;
- supplying the internal market with high quality sea products;
- improving the income of producers with value added sea food products in the global market;
- reducing the negative impact on ecosystems, with actions to preserve the sustainability of water, land and biodiversity; and
- promoting sustainable rural development through co-ordination with rural society.

CONAPESCA developed the Sector Programme of Fishing and Aquaculture to articulate, formulate and pursue national and international policies based on a Strengths, Weaknesses, Opportunities, Threats (SWOT) and Political-Legal, Economical, Socio-Cultural and Technological (PEST) analysis to identify problems in each region and act to improve national production. Short, medium- and long-term objectives have been set to produce a modern and competitive aquaculture and fisheries sector. It includes the following:

- co-ordination between institutions of marine security, inspection and surveillance, social development and promotion;
- application of strategies to develop social programmes;
- updating the legal framework in a responsible and dynamic way;
- developing coordination actions for aquaculture and fisheries;
- developing actions that guarantee technological efficiency;
- developing strategic actions to consolidate a modern and competitive sector.

During 2008 and 2009, Mexico implemented the Fisheries Management Programme as a policy instrument for regulating fisheries and fisheries management. The programme induces and incorporates sustainable use strategies, guidelines and management measures for local decision-making, state and regional control and fisheries management.

Post harvesting policies and practices

Responsibility to enforce strict food hygiene and sanitary issue lies with the National Service of Safety and Quality of Agro-alimentary products (SENASICA), a body of SAGARPA. CONAPESCA in co-ordination with the National Institute of Capacity Development of the Rural Sector (INCA RURAL), developed regional strategic projects for the development of trout in the states of Michoacán and Mexico and for good practices in squid in the state of Yucatán and shrimp in the state of Sinaloa. In 2009, MXN 12 million were invested in an intensive training programme in which 3 250 professionals in fisheries and aquaculture participated.

The Value Networks Strengthening and Construction Programme were implemented to consolidate fishery and aquaculture production units into more competitive value networks. This programme establishes Product System Committees made up of representatives of the production chain at state, regional and national levels to serve as a planning and communication mechanism. Each Product System Committee has resources

and guidelines to implement Master Programmes with the goal that every decision maker has a strategic plan to increase competitiveness at short-, medium- and long-term.

The Production System Committees are supported by research centres, universities and institutes, all levels of government and industry. Currently, a total of 45 state committees, eight national committees and one regional committee for species product system have been established. CONAPESCA has constituted 34 civil associations of producers, 30 state master programme and eight national master programmes that contributed on the creation of ten production chains. In total, these organisations represented about 68% of fish and shellfish production and 71% of its market value.

The volume of processed products dropped to 894 481 tonnes in 2006 from 963 562 tonnes in 2005 due to substantial decreases in Sargasso's industrialisation and a decrease in tuna resource availability.

Markets and trade

Markets

Over 80% of domestic fishery products were consumed fresh or frozen. In 2009, per capita consumption for seafood products was 12.8 kg and consumption in urban zones was higher than in rural areas. Seafood consumption is lower in places distant from coastal areas and showed strong seasonal preference.

The storage and distribution infrastructure for seafood in Mexico is limited with only two centres located in Mexico City and the state of Jalisco. They are over capacity and do not meet international standards of quality. In 2008, the federal government designed the "Mercamar"project to develop storage centres and strategic distribution channels to increase supply with competitive prices and better quality. This first phase of this project, which consisted of social, technical and market evaluations, was completed in 2008; the second phase is to complete the site survey, market research and study of local sizing, the executive project with architectural plans, promotion and investors, construction and design of warehouses, and implementation of the project operation.

Seafood promotion campaigns have been carried out jointly with the sector to increase consumption of fishery and aquaculture products and to improve dietary habits. These activities are to be linked with those of other institutions working in food orientation and promotion with the intent of opening new opportunities to promote fishery products; for example, producers will participate in international and national shows. Since 2004, slightly more than MXN 7.6 million was channelled to carry out promotional events such as Pescamar, World Aquaculture Society, Aquaculture International Forum and Baja Sea Food.

Mexico has taken actions to guarantee enough volume of Mexican aquaculture and fishery products with more species selection and accessible prices. Since 2004, the National Product System Committees have been developing marketing strategies for species such as tilapia, catfish, giant squid and oyster.

Trade

Volumes and values

In 2009, Mexico exported USD 741 million of fisheries products and imported USD 279 million resulting in a positive balance of USD 463 million. The main export destinations were the United States (67.0%), Japan (6.2%), Spain (4.0%), Hong Kong (2.7%), and Chinese Taipei (2.7%). Shrimp, flake, sardine, octopus and tuna were the main species.

Policy changes

Free trade agreements have led to new and gradual tariff reductions. Specific objectives with respect to the fisheries sector existing agreements and in ongoing negotiations are as follows:

- reducing tariff and non-tariff barriers;
- eliminating prohibitions and quotas for fishery products imports;
- avoidance of sanitary and phytosanitary regulations restricting fishery trade through establishment of mechanisms and petitions to adopt international standards and mutual recognition of verification and sanitary certification systems;
- avoidance of discriminatory protection and having emergent protection mechanisms;
- rules of origin: insure FTA (TLC) benefits will apply to fresh products and/or legally processed products, with flag and registration in jurisdictional waters of any party country;
- dispute settlement: establishing rapid mechanisms to interpret FTAs.

Outlook

Work is on-going to improve the environmental and economic performance of the fisheries and aquaculture sector. This includes the development of the value chain through Product System Committees, to improve integration, management and technical skills, and implementation of strategic projects. Investing in human capital will promote better practices in production, processing, management, financing, and marketing. Increasing domestic consumption will be carried out through marketing and promotion. The rehabilitation of the lagoon systems will improve water quality, mitigate the effects of global warming, and help to increase productivity and incomes in the sector and related activities.

Developing focal points will be identified according to species and regions. More resources will be allocated to the Rural Aquaculture National Programme to expand its coverage. CONAPESCA has developed the "Strategic Projects of CONAPESCA" to create more and better jobs, diminish poverty, and promote competitiveness and sustainable development. Long-term development projects will be financed through co-ordination between CONAPESCA, FIRA and Rural Financial. One of the most important projects is the PROMAR, a fund that guarantees the financial operations and supports the services of fishing projects.

CONAPESCA will establish action plans in co-ordination with INCA Rural and the Mexico Supreme Quality Civil Association relating to the accreditation process of Lender of Professionals Services in technical assistance and training programmes.

OECD Review of Fisheries 2011
Policies and Summary Statistics
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PART III

Chapter 19

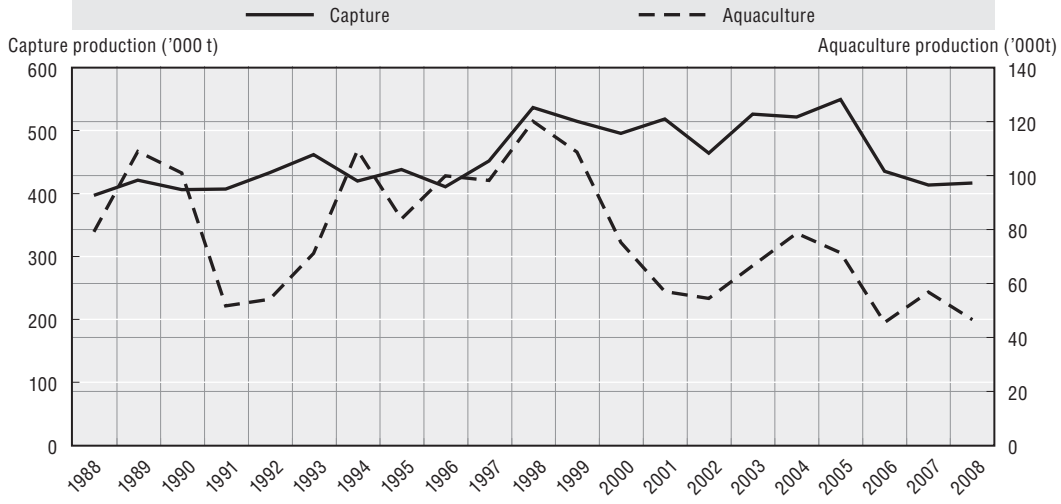
Netherlands

Netherlands

Summary of recent developments

- Total production value in 2008 declined slightly, due mostly to low prices for important species and high energy costs. Segments were differently affected.
- In 2009, total revenues are estimated to be lower than in 2008, but so are total costs. As a result, the beam trawl fleet will make a small profit or a small loss. Shrimp vessels did not perform very well in 2009 due to low prices. The pelagic fleet is faced with difficulties due to lower quota and prices. In 2008, the pelagic fishery in EU waters (Northern Europe) did well compared with the Pacific and near Mauritania.
- The revision of the EU recovery plan for cod in November 2008 had considerable implications for the Dutch fishing sector, in particular for vessels that had converted from beam trawl to more sustainable gear types. In the Netherlands, contrary to most other European countries, this resulted in an increase in fishing effort for certain demersal fisheries and an equal decrease in effort in the traditional beam trawl fisheries. As a result, some fisheries had to be temporarily closed due to the shortage of fishing days.
- A tripartite agreement (covenant) has been created in which government, fishing industry and civil society organisations work together on the transformation towards a sustainable North Sea fisheries.

Harvesting and aquaculture production (tonnes)

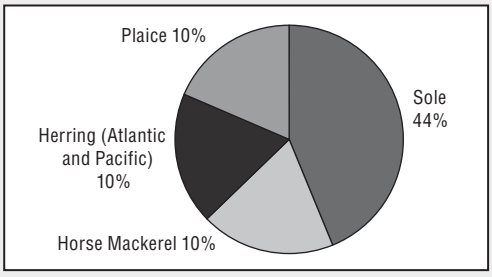


Source: FAO FishStat Database.

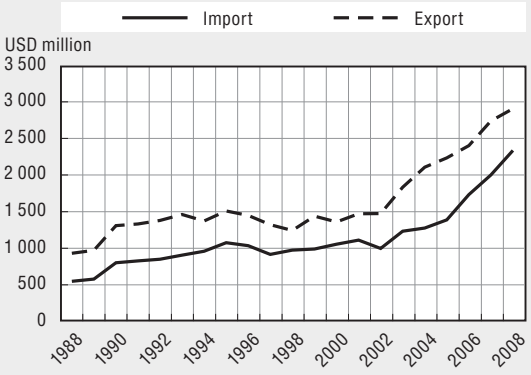
Key characteristics of the sector

- In terms of composition of the value of landings, sole achieved the highest value of landings in 2008, followed by shrimp and plaice. The main species for the pelagic fleet in terms of value of landings were horse mackerel and Chilean mackerel. Chilean mackerel is a relatively new target species.
- The export value of fish and fish products rose by nearly 2% in 2008. The total value of exported fish was just above EUR 2.3 billion, slightly higher than in 2007. The imported value amounted to over EUR 1.7 billion. In 2008, the value of imports from countries outside the European Union rose by 24% and to EUR 911 million and surpassed the value of imports from within the European Union (EUR 825 million). Imports from Germany, Belgium and the United Kingdom declined, while those from the Baltic states and particularly Poland rose.
- In 2008, the fleet consisted of 308 active cutters, 14 trawlers, and 76 active dredgers. Almost 2 000 fishers work on board of a vessel, and well over 200 on board of a dredger. Compared to 2007, the fleet decreased in size by 11%, due mainly to a decommissioning scheme at the beginning of 2008. This resulted in a loss of 100 jobs in the cutter sector. However, the overall the number of jobs increased slightly.
- In 2008, the revenue generated by the Dutch fishing fleet was EUR 475 million.

Key species landed by value in 2008



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	2 200	2 350	6.8
Number of fish farmers	. .	220	. .
Total number of vessels	1 096	. .	. .
Total tonnage of fleets	212 355	. .	. .

Legal and institutional framework

The Netherlands' resource management and conservation policy is carried out in accordance with the Common Fisheries Policy of the European Union. The legal basis is the complete set of rules and regulations as agreed by the Council of Fisheries Ministers of the European Union. In addition, the Dutch Fisheries Act of 1963 provides for regulations regarding national formulation and implementation of policies for, among other areas: sea fisheries, aquaculture, inland fisheries and recreational fisheries.

Capture fisheries

Performance

Total production value declined slightly in 2008. Due to relative low prices for fish, particularly for plaice, income for the beam trawl fleet lagged behind the general trend. Other segments performed relatively well, even though they were also affected by general low prices and high energy costs. As a result of efforts to reduce fuel consumption, both total fuel consumption and average fuel consumption per vessel decreased.

In 2009, total revenues and costs are estimated to be lower. Shrimp vessels did not perform very well in 2009 due to low prices. The 24-40 metres demersal trawls equipped with gears such as twin rig and fly shoot performed well on average. These vessels are particularly fuel efficient. The pelagic fleet is facing difficulties due to lower quotas and lower prices. In 2008, pelagic fishery in EU waters (Northern Europe) did well compared with fisheries in the Pacific and near Mauritania.

The revision of the EU recovery plan for cod in November 2008 had considerable implications for the Dutch sector, in particular for vessels that had converted from beam trawl to more sustainable gear types such as twin rig and fly shoot (TR1 and TR2 gear). New baselines for days at sea for different gear types were set on the basis of historical effort data. The normal trend within Europe was a decrease in fishing effort. However, in the Netherlands a different development took place: an increase in fishing effort for certain demersal fisheries and an equal decrease in effort utilisation of the traditional beam trawl fisheries. The result was a shortage in days for TR1 and TR2 in 2009. The TR1 fishery even had to be temporarily closed.

Both the total value and the volume of fish consumed in the Netherlands increased from 2008 to 2009. The total value of fish consumed at home in 2009 (including crustaceans and shellfish) was EUR 513 million. Canned tuna was the most popular fish in volume, followed by pangasius. In value, salted herring and smoked salmon were most popular. On average, Dutch consumers eat fish once every three weeks, which is considerably less than advised by the Health Council of the Netherlands (twice a week).

Management of commercial fisheries

No major changes were implemented in the general management regime in the Netherlands. The co-management system, which started in 1993, is still operational. A very large share of fishers in the cutter sector voluntarily joined this system, enabling them to optimise the economic use of their individual transferable quota (ITQ). In 2005, government and industry agreed to extend the co-management system to control and enforcement of engine power.

The government promoted the transition from beam trawl to more sustainable (less bottom damage and less fuel consumption) gears like twin rig, otter trawls, squid jigging, and fly shoot. In 2008, around 40 vessels used this provision.

In 2009, a capacity limitation of the small gill net fleet was introduced through a "days at sea" system. This measure was necessary because of the increasing catches of cod and other commercial fish, in addition to putting an end to the increasing number of by-catch of the protected harbour porpoise.

As a consequence of the implementation of the Habitats and Bird Directive, a management plan was adopted for the Voordelta. For two areas in the coastal zone (Vlakte van Raan and the North Sea Coastal Zone), draft designation decrees have been published in the official journal. The Dutch government has announced the publication of draft designation decrees for the Natura 2000 sites in the Dutch Exclusive Economic Zone (EEZ).

The Fisheries Innovation Platform is a four-year project that was established by the Dutch Minister of Agriculture, Nature and Food Quality to encourage innovation towards sustainable and profitable development of the North Sea Fisheries sector and related supply chain. The Fisheries Innovation Platform has ten members representing various sectors of society including research, NGOs, political parties, the government, and the fisheries industry. The Platform is supported by an advisory group that includes fishers. In the first three years, 70 pilot projects for more sustainable and profitable fisheries were implemented.

Following the implementation of the European Eel regulation and the approval of the Dutch Eel management plan by the Commission, the eel fishery (in inland and coastal waters) has been restricted by a three-month closing period (from September to December).

A tripartite agreement (covenant) has been created in which government, fishing industry and civil society organisations work together on the transformation towards a sustainable North Sea fisheries.

Management of recreational fishing

Recreational fisheries are regulated by restrictions on the amount and kind of gear used, closing seasons, and minimum size limits for specific fish species. It is prohibited to sell fish caught in recreational fisheries. No major changes were introduced in the management of recreational fisheries.

Aquaculture

Policy changes

New policies were introduced regarding fish welfare. New European legislation regarding fish health and the use of non-indigenous species will also affect the aquaculture sector. Mussel production is under scrutiny, due to the fact that some of the activities take place in a national wetland area (the Waddenzee). In 2006, the harvest of mussel larvae was prohibited by the Dutch court in areas where an impact assessment has not been undertaken. In 2008, a covenant was established between the mussel sector, the government and three non-governmental organisations to work on a conservation task that must be completed by 2020. Part of the agreement is that seabed fishing is to be gradually phased out.

Production facilities, values and volumes

Aquaculture is concentrated on the production of shellfish, in particular mussels and oysters in coastal estuaries. In 2008, the total revenue of the mussel sector was EUR 66 million and the total revenue of the oyster sector was EUR 67 million.

Intensive land-based culture of finfish takes place in closed re-circulation systems. Major species are eel and catfish. In general, the policy favours the further development of fish culture in closed re-circulation systems. European Fisheries Fund (EFF) finance is used to stimulate this development.

Post-harvesting policies and practices

Food safety policy is carried out in accordance with European rules.

The Pelagic Freezer-Trawler Association (PFA) was awarded Marine Stewardship Council (MSC) certification for sustainable fisheries for mackerel in 2009 and is currently in the process of application for the Atlanto-Scandic herring fisheries. In 2006, the PFA was already certified for North Sea herring fisheries. The North Sea brown shrimp fishery is in the pre-assessment stage of the MSC programme.

Government financial transfers

General services consist mainly of research costs. Neither revenue enhancing transfers nor cost reducing transfers took place in the Netherlands.

Structural adjustment

A scheme was opened for investment in fishing vessels to provide an alternative to beam trawl. The purpose of this scheme is to modernise fishing vessels and the placing of devices on board fishing vessels to reduce soil disturbance and improve product quality, energy efficiency, and selectivity. The value of the scheme was EUR 2 million, including 40% EFF contribution.

In 2007-08, 23 vessels were decommissioned, for which a total of EUR 27.5 million was disbursed under the European Fisheries Fund (EFF).

Transfer policies

A Fishery Guarantee Fund was set up to support fishing companies to make investments, improving the sustainability of their fishing activities. Due to a lack of interest, the fund was closed in 2009.

Structural adjustment

A subsidiary scheme was in place for the EFF priorities Axis 2 (investments in aquaculture) and Axis 3 (innovation in the fish chain) in 2008 and 2009. A total of 38 projects were approved with a value of EUR 11.5 million, including 30% EFF contribution.

Outlook

Despite the favourable policy, fish aquaculture production in the Netherlands has declined considerably. Besides the economic crisis, other factors such as marketing played a role. The Ministry of Agriculture, Nature and Food Quality has initiated the development of an action plan for fish aquaculture production using a participatory approach that involves the major stakeholders.

Dutch inland fisheries depend to a great extend on eel fishery. In order to partly compensate for the loss of income, eel fishermen can apply for a financial contribution from the government.

At the end of the Dutch review on a new European fisheries policy, *Fish, As Sustainable Capital* was published. It contains three important new spearheads: focus on a more sustainable use of our ecological capital; a bigger role for the market; and a different method of decision-making and implementation. A broad group of stakeholders has been involved in shaping the Dutch view on the new CFP.

The Dutch Government stimulates and facilitates certification. It supports the fishing industry to start certification of their fisheries to enhance the sustainability of the sector and to contribute to the realisation of the goals of the fisheries policy.

As regards the implementation of the Habitats and Bird Directive in 2010, the coastal zone areas Vlakte van de Raan and the North Sea Coastal zone will be formally designated so that management plans can be developed. The Dutch Act on Nature Conservation will be amended with a view to applying to the Dutch EEZ. After this amendment for the three areas in the EEZ (Doggerbank, Frisian Front and Cleaver Bank), draft designation decrees will be published.

On the request of the Dutch Government, the International Council for the Exploration of the Sea (ICES) will advise on fisheries management options for the Dutch EEZ in 2011 in the framework of the FIMPAS (Fisheries Measures in Protected Areas) project. As for the fisheries measures in the coastal zone areas, a decision by the Dutch government was expected by the end of 2010 or start of 2011.

OECD Review of Fisheries 2011
Policies and Summary Statistics
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PART III

Chapter 20

New Zealand

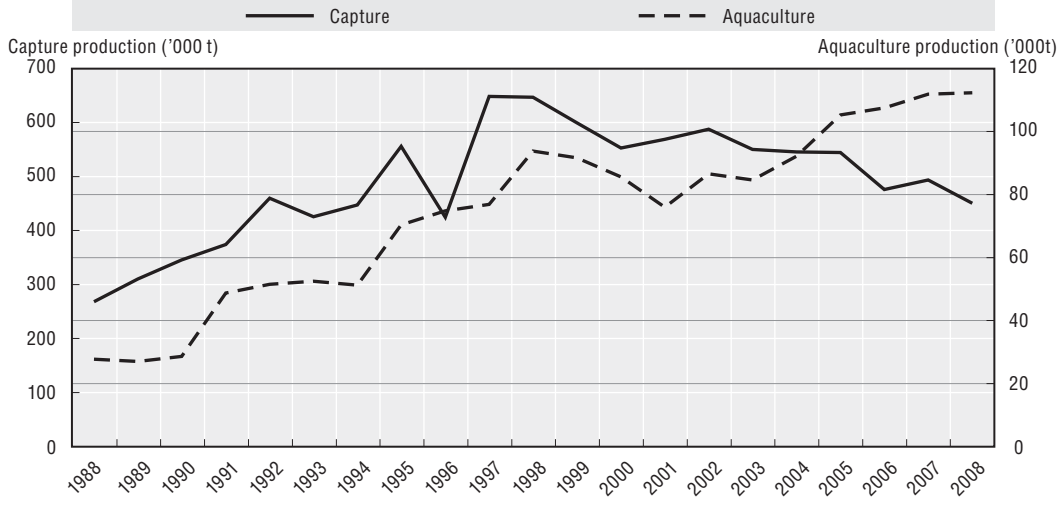
New Zealand

Summary of recent developments

The overall objective for the fisheries sector is "New Zealanders' maximising benefits from the use of fisheries within environmental limits". Achievements from 2008 and 2009 include:

- "Fisheries 2030", a strategic direction providing greater clarity and certainty to all stakeholders;
- objectives-based approach to fisheries management through Fisheries Plans and standards/ organisational procedures to support the Plans and ongoing fisheries management;
- working with the industry to achieve environmental certification of seafood products;
- better engagement with commercial, recreational and customary interests;
- finalising, adopting and implementing international guidelines and conventions (*e.g.* Management of Deep Sea Fisheries on the High Seas; South Pacific Regional Fisheries Management Organisation, Port State Measures Agreement);
- work programme to support sustainable aquaculture development and progressing the Crown's settlement obligations to Maori in the aquaculture sector under the Treaty of Waitangi;
- threat Management Plan to manage human-induced threats to Hector's and Maui's dolphins;
- upgrading the monitoring and surveillance capability and improving coordination between New Zealand maritime security agencies and outreach programmes to Pacific Island countries;
- participating in the World Trade Organization negotiations to end fishing subsidies;
- negotiating free trade agreements with China and the Republic of Korea.

Harvesting and aquaculture production (tonnes)

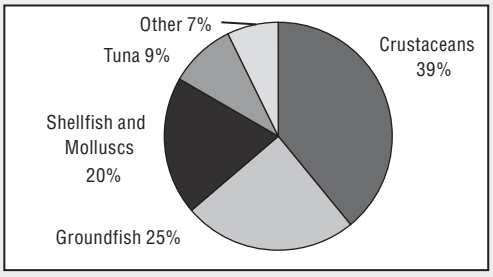


Source: FAO FishStat Database.

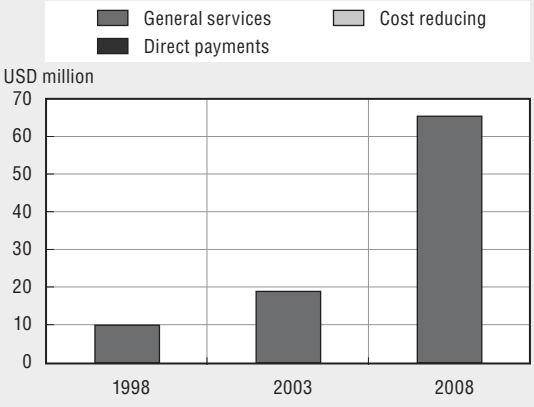
Key characteristics of the sector

- New Zealand's seafood industry harvests approximately 533 000 tonnes from wild fisheries and aquaculture each year. The value of this harvest ranges from NZD 1.2 to NZD 1.5 billion per annum, of which the aquaculture industry contributes about NZD 280 million per annum.
- New Zealand does not subsidies the fisheries sector. It operates a cost recovery scheme to fund part of the general service costs incurred for fisheries management through different types of levies.
- Seafood exports were the seventh largest export earner in 2009. Domestic seafood sales are approximately NZD 150 million annually.
- The key export markets are Australia (19%), Hong Kong (16.5%), the European Union (14.2%), and China 12.3%) followed closely by the United States and Japan. There has been significant growth in exports to Hong Kong and China since 2007.
- Employment in the harvesting, aquaculture and processing sector has slightly decreased to 8 090 people in 2008. Processing accounts for the major share, followed by harvesting and aquaculture.
- The fleet has reduced in terms of numbers over time while its tonnage increased considerably.

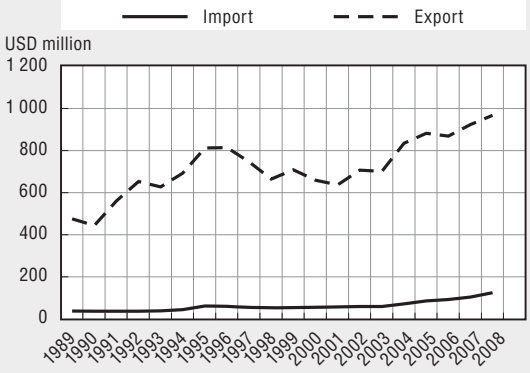
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	10 000[1]	1 550	–84.5
Number of fish farmers	n.a.	780	n.a.
Total number of vessels	1 988	1 435	–27.8
Total tonnage of fleets	85 595	130 785	52.8

n.a.: not available.
1. Harvesting, processing and aquaculture.

Legal and institutional framework

The Fisheries Act 1996 provides the framework for fisheries management in New Zealand. Its purpose is to provide for the utilisation of New Zealand's fisheries resources while ensuring their sustainable level and the avoidance, remedy or mitigation of any adverse effects on the environment.

The Act and the subordinate legislation (fisheries regulations) provide for the fishing interests of all fishing groups (commercial, recreational, and customary Maori). The Act is administered primarily by the Ministry of Fisheries. Key decisions are made by the Minister of Fisheries and Aquaculture and the Chief Executive of the Ministry of Fisheries.

Commercial fisheries

Commercial fisheries in New Zealand are managed through a Quota Management System (QMS) based on Individual Transferable Quotas (ITQs). The total quantity of fish that can be taken for each QMS fishery is the Total Allowable Catch (TAC). From the TAC an allowance is made to provide for recreational fishing, customary Maori uses and other sources of fishing-related mortality. The remainder is available to the commercial sector as the Total Allowable Commercial Catch (TACC – total quantity of each fish stock that the commercial fishing industry can catch during that year). Quota is a right which allows people to own a share of the Total Allowable Catch (TACC) for a particular species in a defined area. Quota can be bought or sold.

Within the commercial catch limit, access is determined on an annual basis by ownership of Annual Catch Entitlement (ACE) and the possession of a fishing permit. ACE is generated in proportion to the amount of quota owned by a person at the start of each fishing year. ACE is the tonnage equivalent of the quota share. For example, if a quota owner owns 10% of the quota for a stock, and the TACC is set at the start of the fishing year at 200 tonnes, that quota owner receives 20 tonnes of ACE. The quota owner may choose to fish the ACE they receive or on-sell the ACE.

ACE provides the right to harvest a specific amount of a particular species in a defined area. As with quota, there is a register of ACE holdings and transactions.

Commercial fishers must ensure that all of their catch of QMS fish stocks is covered by their catching rights (or ACE). This system is known as the catch balancing regime and has the objective to ensure that the commercial catch limit is not overfished. This is achieved through the use of deemed values. If a fisher does not hold sufficient ACE, they incur a financial cost – the deemed value – for taking the fish. The deemed value is set at a rate that eliminates any financial benefit that the fisher may receive from landing the fish and acts as an incentive for fishers to cover all their catch with ACE.

Restrictions are placed on the amount of quota that can be held by any one person, including their associates. These range from 10% for some species to 45% for others. There are no aggregation limits on the ownership of ACE.

Foreign ownership of quota or ACE is not allowed unless a specific exemption is granted by the Minister of Fisheries and the Overseas Investment Commission. To be exempted, a foreign company must demonstrate that New Zealand will benefit from the ownership. If this benefit ceases, the ownership or interest in quota or ACE can be taken away without any compensation being offered.

Commercial fishing vessels must be registered under the Fisheries Act 1996. Vessel numbers are not restricted. New Zealand commercial fishers can charter foreign flagged

fishing vessels to harvest fish. To do so, consent is required from the Ministry of Fisheries and the vessel must be registered.

Other sustainability measures include controls to avoid or mitigate by catch of protected species (*e.g.* albatross, Hooker sea lions). Technical measures (*e.g.* area closures, gear restrictions) are also used.

Recreational fishing

The basic legal right underpinning recreational fishing is an access right to go fishing for personal use. Recreational interests are recognised in the Fisheries Act 1996, which establishes an allowance for recreational fishing within the TAC.

The public access right is subject to restrictions under the recreational fishing regulations such as daily bag limits, method restrictions, size limits and seasonal closures. Recreational catch cannot be sold and there are no reporting requirements for recreational fishing.

Customary fishing

In 1992, an Act of Parliament recognised that the Crown has an obligation to recognise Maori customary non-commercial fishing rights and management practices. The Crown is also obliged to consult with *tangata whenua* about policies to help recognise use and management practices of Maori in the exercise of non-commercial fishing rights.

The Fisheries Act provides all the customary (commercial and non-commercial) fisheries management tools and processes that are available to Maori in recognition of customary rights. Customary fishing regulations recognise and provide for customary food gathering by Maori. Customary fishing must be authorised and the catch cannot be sold.

Capture fisheries

New Zealand's seafood industry sustainably harvests approximately 533 000 tonnes from wild fisheries and aquaculture each year. The value of this harvest ranges from NZD 1.2 to NZD 1.5 billion per annum, of which the aquaculture industry contributes about NZD 280 million per annum. Seafood exports have consistently rank as New Zealand's fourth or fifth largest export earner but it was the seventh largest export earner in 2009.

There are about 130 species fished commercially in the New Zealand exclusive economic zone. 66% of fish caught in the wild fisheries is taken in deepwater fisheries (major species: squid, hoki, ling, hake, oreo dories, orange roughy, southern blue whiting). Important inshore and shellfish species include spiny rock lobster, paua, and snapper.

Recreational fishers target snapper, blue cod, kahawai, kingfish, rock lobster, paua and scallops.

Within the fishing industry, exports provide approximately 90% of earnings. In 2008, 296 179 tonnes of fish was exported (NZD 1.35 billion), in 2009, 286 604 tonnes (NZD 1.42 billion).

New Zealand operates under the Quota Management System (QMS) described above. Input controls complement the QMS and deal with specific management issues for particular fisheries [*e.g.* minimum legal size limits, net mesh size limits, mitigation measures (*e.g.* tori lines), area restrictions].

The QMS is regarded by New Zealand as its principal management framework. Species are introduced into the QMS in response to either a sustainability concern or to provide for better utilisation.

Table 20.1. **Top species landed by weight, 2008-09**

Species	2008-09 total greenweight kgs
Hoki	89 475 153
Squid	46 310 859
Jack mackerel	40 582 432
Southern blue whiting	37 345 984
Barracouta	26 443 613
Ling	13 113 072
Orange roughy	12 048 800
Silver warehou	8 852 235
Skipjack tuna	4 740 843
Oreos	15 882 833

Note: Figures do not include aquaculture landings.

Table 20.2. **Top five export earners and revenue generated 2008-09**

Fishery	2008		2009	
	Tonnes	Export value NZD (millions)	Tonnes	Export value NZD (millions)
Squid	46 440	71	37 892	75
Hoki	38 722	151	34 858	152
Rock lobster	2 639	180	2 477	184
Orange roughy	5 859	61	4 093	51
Abalone/paua	656	46	885	48

Note: Mussels have been removed because they are not generally a "capture" fishery. The export figures for mussels are included in the aquaculture section.

With limited exceptions, quota is allocated through a tender process. Any previous catch history will not be taken into account, with the exception of highly migratory species. The legislation requires qualifying years for catch history to be designated prior to introduction of the species into the QMS.

Table 20.3. **Employment, 2008-09**

Sector	2008	2009
Marine fishing	1 530	1 820
Seafood processing	5 900	5 850
Marine aquaculture	660	640
Total	**8 090**	**8 310**

Source: Statistics NZ Linked Employer-Employee Data (LEED). In 2004, Statistics New Zealand changed their employment measure from FTEs to Employee Count (EC). The nature of the EC measure means that it can result in an undercount of total employment because it excludes non-employee working proprietors. These working proprietors play a significant role in the seafood industry, particularly for catch activity.

As at 1 October 2009, there were 98 species and 632 fish stocks in the QMS. Considerable research effort goes into collecting data that can be used to assess the status of the most important stocks.

In 2009, there was sufficient information to report on the status of 117 of these stocks or sub-stocks, of which 79 were considered near or above target levels set out in the

Fisheries Act. Of the 38 stocks known to be below target levels, two are highly migratory tuna species (which New Zealand has limited influence over). Other stocks currently below target levels include: several orange roughy stocks or sub-stocks, black cardinal fish, gemfish, two rock lobster stocks, Tasman Bay and Golden Bay scallops, three paua stocks, west coast North Island snapper, all bluenose stocks and longfin eels. Allowable catch levels have been reduced in all these fisheries to allow them to rebuild to target levels.

In December 2005, the Ministry of Fisheries launched a website containing information on the status of New Zealand's fish stocks. It can be accessed at: *http://fs.fish.govt.nz/Page.aspx?pk=16&tk=345*.

Management of commercial fisheries

The Ministry is implementing an objectives–based approach to fisheries management using National Fisheries Plans. Five national-scope plans covering New Zealand's deepwater, highly migratory and inshore (shellfish, freshwater and finfish) stocks are being developed.

The fisheries plans will describe how New Zealanders can get best value from their fisheries within environmental limits and standards set by the Government. Fisheries plans will do the following:

- set objectives for fisheries to ensure government objectives are met;
- specify the strategies that will be applied to achieve the objective;
- include an annual planning process that engages tangata whenua and stakeholders in the identification of annual fishery service needs and priorities;
- make fisheries management more transparent.

The fisheries' plans for deepwater and highly migratory species have been consulted on and are currently being finalised. Fisheries' plans for inshore shellfish, inshore finfish and freshwater are underway.

The Ministry of Fisheries is developing a number of standards and organisational procedures to support fisheries plans and ongoing fisheries management. Standards set mandatory minimum performance levels required to ensure fisheries outcomes are met. To date the Minister has approved the Harvest Strategy, Deemed Value, and QMS introduction standards. The Deemed Value Standard is currently being reviewed and updated and Seabird and Benthic Impact standards are in varying stages of development. Additional standards will be developed as required.

Management of recreational fisheries

Approximately 20% of New Zealand's population fish recreationally and target approximately 40 different types of fish species (key targets: snapper, kahawai, kingfish, blue cod, rock lobster, scallops).

Recreational fishers have open access rights to the fishery and no licence is required. Except for some allocation provisions for species in some areas there are no have hard constraints on total catch. The fishery is managed through input controls (size limits, daily limits, area closures).

Given the importance of the recreational fishery and its growth, the Ministry of Fisheries has focussed on initiatives to improve the overall management of the fishery. The following initiatives have focused on improving engagement, and improving the collection of information:

- re-design of the Ministry's Regional Recreational Fishing Forum network to better align with the primary fisheries management area boundaries and to place greater emphasis

on mandated representatives; forums are linked to the Ministry's fisheries planning and decision making processes;

- establishment of an annual national meeting of Regional Recreational Fishing Forum representatives and national recreational organisation representatives to inform cross-region prioritisation and to identify and discuss strategic policy issues;
- establishment of a multi-method, Large Scale Multispecies Survey approach to estimate recreational fishers' catch in key stocks, including cross-method checking and validation;
- working with charter vessel operators to introduce a registry of all charter boat operations in order to gather catch and effort by recreational fisheries on their boats.

Aboriginal fisheries

In 1992, the Crown and *iwi* negotiated a comprehensive Settlement of all commercial fisheries and aquaculture rights and obligations, culminating in the Treaty of Waitangi Fisheries Claims Settlement Act 1992 and the Maori Commercial Aquaculture Claims Settlement Act 2004. In addition to these commercial rights, the Settlement provided for rights which were to be further articulated, such as in the development of policies and regulations to provide for customary non-commercial fishing. Stemming from this obligation, regulations were developed to strengthen some of the *tangata whenua* fisheries management rights for customary fishing in a way that best fits their local practices.

These regulations enable *Kaitiaki* (guardians) to issue authorisations for people to gather seafood for customary purposes. The regulations also recognise the special relationship between Maori and their traditional fishing grounds by providing for the establishment of *mätaitai* reserves which are managed by local Maori through bylaws. 15 *mätaitai* reserves have been established to date.

Maori may also seek the establishment of *taiapure*-local fisheries areas for areas of special significance to *tangata whenua*. Once a *taiapure*-local fisheries area has been established, a management committee is appointed on the basis of nominations from the local Maori community. *Taiapure* management committees may recommend the making of general fisheries regulations (commercial, recreational or customary fishing) for *taiapure* areas to the Minister of Fisheries. Eight *taiapure*-local fisheries areas have been established to date.

QMS fisheries with a customary fishing interest include an allowance for customary catch in Government TACC decisions. The Minister is required to take into account *mätaitai* reserves and any fishing restrictions established by the customary regulatory framework.

The government is required to provide for the input and participation of *tangata whenua* in New Zealand's fisheries management decision making processes. This is ensured through *Iwi* Fish Plans (IFP) and Forum Fish Plans (FFP) which contribute to the Ministry of Fisheries business planning and the consideration of indigenous groups' values in the Minister's management decisions.

These plans increase *tangata whenua's* ability to influence fish stock management. FFP may be used to signal a desire to make use of customary tools if they are the most appropriate means of meeting *tangata whenua* objectives. The relevant application processes remain unchanged.

At the time of the aquaculture reforms a settlement was negotiated with Maori for grievances regarding commercial aquaculture interests since 1992.[1] Under the Maori Commercial Aquaculture Settlement Act 2004, Maori have the rights to 20% of marine farming space created since September 1992.

The Maori Commercial Aquaculture Claims Settlement (Regional Agreements) Amendment Act 2010 passed into law in March 2010. The amendment gives effect to a Deed of Settlement between the Crown and specific *iwi* for an early settlement of the Crown's pre-commencement space obligations in the South Island and Coromandel region. A payment of NZD 100 million was paid to a Trustee for allocation to those *iwi*. The Deed of Settlement also provides for the Crown and South Island *iwi* to agree the values for permit decisions made after the signing of the Agreement in Principle, the precursor to the Deed of Settlement. NZD 1.145 million has been paid for these posts Agreement in Principle decisions.

The amended Act will also give effect to future agreements the Crown may enter into with remaining *iwi* for an early settlement of the Crown's pre-commencement space obligations in their regions.

Monitoring and enforcement

During 2008-09, the Ministry of Fisheries has implemented the Fisheries Service Delivery Model which uses a sliding scale approach to achieving compliance. Frontline officers use this sliding scale approach when dealing with non-compliance, starting with assisting low risk fishers by way of education and warnings; directing medium risk, opportunistic offenders via infringement action; and the high risk, criminally intent being dealt with through prosecution with possible custodial sentence.

In the past few years, New Zealand has upgraded its monitoring and surveillance ability:

- New maritime patrol vessels and upgraded aircraft surveillance systems are integrated into fisheries monitoring and enforcement activity as the assets become available. The necessary enhancements to Ministry procedures and systems including patrol targeting, personnel training, and information collection and management to maximise the benefits from these assets are being developed constantly. This process will continue for the next few years and is key to ensuring the integrity of the domestic fisheries and to contribute to regional/international fisheries compliance.
- Improved co-ordination between New Zealand maritime security agencies and outreach programmes to Pacific Island countries is leading to improved targeting of patrolling of high seas areas in the Pacific and the economic exclusive zone's of Pacific Island countries. Where possible, assistance has been provided to enhance the capability and/or capacity of Pacific Island countries to deal with the resulting information and detected illegal fishing. Arrangements (*e.g. Te Vaka Toa*) have also been developed for more collaboration between states in the Polynesian sub-region on MCS issues and in particular more effective information sharing between MCS practitioners.

The Ministry of Fisheries is working in many areas to improve its ability to assess the effectiveness of its monitoring and enforcement (compliance) approaches. These include:

- Working with New Zealand civilian law enforcement agencies to coordinate the collection and sharing of law enforcement related information about vessels and their activity on approaches to, and in, New Zealand fisheries waters.
- The implementation of a new intelligence structure which will strengthen intelligence collection and flow from the frontline through to senior management making them better informed of potential risks facing New Zealand's fisheries. This will support New Zealand's domestic compliance programmes throughout the supply and provide input to regional and sub-regional programmes in support of RFMOs.

- The development of analytical tools to assist in comparing and interpreting significant volumes of data, a range of different types of data and information, for example, fisher reporting of catch by area with independent vessel monitoring reports.
- Continuing work on a project to develop a methodology to estimate the extent of illegal fishing. The Ministry will complete the first phase of the project this year and will identify subsequent development and trialling of a reliable, robust and statistically defensible generic methodology that can then be applied to specific fisheries to estimate the volume of fish removed illegally.

Measure for improving voluntary compliance through co-management and awareness programmes include:

- Working with stakeholders within a fisheries planning process to enhance the development of clear management and compliance objectives and priorities.
- The development of joint industry and government approaches to specific issues, for example, risk matrices to set out applicable minimum monitoring and compliance standards for charter vessels proposing to or already operating in New Zealand waters; commercial operators providing information on entities involved in their paua distribution.
- Continuation of "Coastwatch" programmes which are aired on national, primetime television to highlight offending in the recreational and commercial fisheries.
- Development of targeted programmes in schools and immigrant communities to provide information on fishing rules and why they are important.

Multilateral agreements and arrangements

During 2008-09, New Zealand has participated in the following multilateral initiatives:

- development of International Guidelines on the Management of Deep-Sea Fisheries in the High Seas through the FAO, adopted 29 August 2008;
- negotiation of a binding port State measures agreement through the FAO, initiated in June 2008 and opened for signature 22 November 2009. New Zealand signed on 15 December 2009.

New Zealand is a member of the following RFMOs – the Western and Central Pacific Fisheries Commission, the Commission for the Conservation of Southern Bluefin Tuna, and the Commission for the Conservation of Antarctic Marine Living resources.

New Zealand participated in the negotiations to establish the South Pacific Regional Fisheries Management Organisations (SPRFMO). The eighth meeting in November 2009 concluded negotiations with the adoption of the Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean, together with a Resolution regarding the holding of a Preparatory Conference. At the third and eighth meeting, participants agreed to interim conservation and management measures for bottom fisheries, deepwater gillnetting and pelagic stocks. An interim secretariat was established and is hosted by New Zealand. The Convention was opened for signature and signed by New Zealand in February 2010. It aims to fill the fisheries governance gap that exists on the high seas of the South Pacific Ocean.

The Ministry of Fisheries recently initiated a capacity development programme that aims to increase the capability of Pacific Island individuals, communities, organisations and institutions to develop their abilities to ensure the conservation and sustainable utilisation of Pacific fishery resources. In this context, the Ministry of Fisheries has signed

the *Te Vaka Moana* Arrangement with fisheries agencies from Niue, Tokelau, the Cook Islands, Samoa and Tonga to achieve these aims.

Aquaculture

Policy changes

The New Zealand Government has identified aquaculture as an important sector for economic growth, and subsequently developed a work programme to support sustainable aquaculture development and the industry's goal of reaching NZD 1 billion in annual revenue by 2025. This includes reform of marine aquaculture legislation which aims to: reduce costs, delays and uncertainty with the regulatory process for aquaculture; promote investment in aquaculture development; and enable integrated decision-making that balances aquaculture and other marine interests.

The reform will:

- allow aquaculture activity outside specifically zoned Aquaculture Management Areas;
- ensure aquaculture will continue to be managed by regional councils;
- streamline and integrate the processes that grant permissions required for aquaculture activity;
- streamline the process for obtaining resource consents for existing aquaculture activities;
- establish an Aquaculture Business Unit for planning and development in the Ministry of Fisheries;
- remove species restrictions in some areas, allowing for a greater range of species (including higher value finfish) to be farmed; and
- develop a new mechanism for settlement of the Crown's obligations to M?ori with regard to new aquaculture space.

Aquaculture in New Zealand, which is primarily based on three species: green lipped mussels (Greenshell^{TM} mussels); king salmon; and pacific oysters, makes an important contribution to New Zealand's economy (approximately 18% of total fisheries value).

A number of other marine and freshwater species are also farmed. Research is being conducted to improve techniques for, and the efficiency of, farming a number of species so as to increase commercial viability. Species of particular interest include kingfish and häpuku. This reflects the industry's intention of farming higher value species. New Zealand exports aquaculture produce to 72 countries which accounts for approximately 2/3 of the total revenue for the aquaculture sector.

Table 20.4. **Aquaculture exports, 2008-09**

Species	2008		2009	
	Export weight (tonnes)	Export value NZD (millions)	Export weight (tonnes)	Export value NZD (millions)
Greenshell^{TM} mussels	32 725	203	33 843	202
King salmon	3 494	44	5 081	61
Pacific oysters	1 872	17	2 091	16
Total aquaculture	38 091	265	41 015	279

Note: This is actual weight of product exported; therefore these figures are lower than the equivalent greenweight figure.

Fisheries and the environment

The Fisheries Act establishes strong environmental obligations, including requirements to avoid, remedy, or mitigate any adverse effects of fishing on the aquatic environment. New Zealand continues to take steps to manage the adverse effects of fishing on the aquatic environment.

On 31 August 2009, Cabinet endorsed a shared direction and strategy to improve the environmental and economic performance of the fisheries sector put forward by the Minister of Fisheries. The "Fisheries 2030" strategy[2] brings together work in a comprehensive programme that was developed through engagement with *tangata whenua* and stakeholders to provide direction for the sector. Fisheries 2030 seeks to achieve improved economic benefit through smarter use of our fisheries resources, and provides for increased non-commercial benefits, while protecting the health of the fishery and the marine environment. The strategy also outlines roles for the Government and approaches to most efficiently use available resources. It proposes a long-term goal, outcomes, governance conditions and values and principles with the goal to have New Zealanders maximise benefits from the use of sustainable fisheries.

In January 2006, the New Zealand Government released the Marine Protected Areas Policy and Implementation Plan (MPA Policy). The objective of the MPA Policy is to "protect marine biodiversity by establishing a network of MPAs that is comprehensive and representative of New Zealand's marine habitats and ecosystems". The MPA policy outlines a range of management tools that may be used to protect marine habitats and ecosystems along with Network Design and Planning Principles to aid in the selection of potential MPA sites.

The government is currently in the process of describing which habitats are protected in existing MPAs to deduce the priorities for future protection. Regional forums are also assisting the government to select appropriate candidate sites and management tools. The MPAs will then be finalised in legislation.

In 1975, New Zealand established its first marine reserve, one of the world's first no take marine reserves. There are currently 33 marine reserves in New Zealand ranging in size from 0.93 km^2 to 7 480 km^2. They cover a total area of 12 786 km^2 around New Zealand's coast. In November 2007, the New Zealand Government implemented a proposal by the fishing industry to close 30% (1.2 million km^2) of the EEZ and some areas beyond the EEZ, to bottom trawling and dredging.

With the benthic protection areas implemented, New Zealand has now protected 32% of its EEZ. In total, this includes 28% of Underwater Topographic Features (including seamounts); 52% of seamounts (underwater mountains over 1 000 metres in height); and 88% of active hydrothermal vents.

New Zealand currently has a number of protection measures in place (including Benthic Protection Areas) that contribute to the New Zealand Government's obligations to protect and manage its marine environment. In line with current legislative obligations, and government policy, the Ministry is developing a Benthic Impact Standard that looks at the impacts of fishing on New Zealand's seabed.

The Benthic Impact Standard will provide clarity for decision makers on whether the level of protection currently in place in New Zealand's economic exclusive zone is sufficient to avoid remedy and mitigate adverse effects from fishing. The Benthic Impact Standard will determine when an effect of fishing on the seabed is adverse and what range of actions and approaches should be undertaken to avoid, remedy, or mitigate this effect.

The process for developing the standard started in January 2010. The final standard is expected to be approved in June 2011.

In 2004, the Ministers of Conservation and Fisheries released New Zealand's National Plan of Action to reduce the incidental catch of seabirds in New Zealand Fisheries (NPOA-Seabirds[3]). The NPOA-Seabirds sets out a strategic framework to reduce seabird bycatch to sustainable levels. However, the NPOA-Seabirds is currently under review to ensure integration with the environmental standards framework (which includes a seabird standard) currently being developed by the Ministry of Fisheries. A number of regulatory and non-regulatory best practice mitigation measures currently apply in New Zealand trawl, pelagic longline and demersal longline fisheries. New Zealand also has an ongoing monitoring and research programme and a risk assessment framework for identifying at-risk seabird species and the fisheries in which they are caught.

Specific measures are in place to manage the effects of fishing on a number of marine mammal species. These include:

- a bycatch limit for New Zealand sea lions in the southern squid fishery;
- an industry code of practice to reduce bycatch of New Zealand fur seals in the hoki fishery; and
- method restrictions in some inshore areas to reduced hectors dolphin and Maui dolphins bycatch.

The Ministry of Fisheries and Department of Conservation have jointly developed a Threat Management Plan to manage human-induced threats to Hector's and Maui's dolphins (New Zealand's only endemic cetacean and one of the world's rarest dolphin species). As part of that plan, the government has implemented a suite of new fishing rules to better manage the impact of fishing on the dolphins. The new rules place restrictions on set net and trawl fishing in inshore waters around the South Island and the west coast of the North Island. The plan includes Marine Mammal Sanctuaries in which rules regulating non-fishing activities (tourism and mining) apply. The Ministry of Fisheries monitors the effectiveness of these measures through data collection and will review the Threat Management Plan in 2013 if necessary.

Government financial transfers

The New Zealand Government does not subsidise the fishery sector, but in fact recovers costs from the commercial fishing industry under the principles defined in the Fisheries Act 1996. Since October 1994, the New Zealand Government recovers the costs associated with fisheries management services and conservation services carried out for the benefit of the commercial sector.[4]

Every year an annual consultation process takes place between the Ministry of Fisheries and stakeholders on the nature and extent of fisheries service to be provided, the costs associated with those services, and their allocation between the commercial sector and the Crown. A summary of the levies charged to participants follows:

- monthly levies on quota holders: main levies to recover management costs within the quota system;
- levies for non-ITQ species: main levies to recover management service costs in non-quota fisheries;
- levies on individual catch limits: apply to permit holders where catch limits are specified on the permits and recover costs related to these fisheries;

Table 20.5. **Total (net) government financial expenditures in support of New Zealand's fishery sector (NZD million)**

Nature of transfer	2007-08	2008-09
Total fisheries export value	1 300	1 350
Direct payments	0	0
Cost reducing transfers	0	0
General services		
Fisheries policy	7	8
Fisheries information	26	28
Fisheries operations	24	25
Fisheries compliance	30	32
Aquaculture settlement	2	2
Sub-total	**89**	**95**
Cost recovery		
Cost recovery levies	–31	–33
Total	**58**	**62**
Percentage of total export value	4.5	4.6

Note: negative values refer to transfers from the industry to the Government.

- aquaculture levies: levies to recover enforcement and research costs related to aquaculture and apply to holders of permits, leases or licenses;
- conservation services levy: intended to recover costs incurred by the Department of Conservation in researching the effects on protected species of bycatch resulting from commercial fishing, and measures to mitigate the adverse effects of commercial fishing on protected species.

New Zealand does not have a social policy with regards to the fisheries sector. Fishers are, like all other members of society, entitled to standard social security provisions.

When TACs are reduced for sustainability reasons, the necessary adjustment and rationalisation required is conducted by fishers and requires no government involvement or financial assistance.

Post-harvesting policies and practices

Food safety

Food safety of fish and fish products is predominantly regulated under the Animal Products Act 1999, administered by the New Zealand Food Safety Authority (NZFSA). All fish exports (about 90% of New Zealand's commercial catch) are regulated by the Animal Products Act. Moreover, because fish sold in the New Zealand market is generally processed through exporting premises, most fish for domestic consumption is also covered by the Animal Products Act.

In general, primary fish processors are required to operate under registered Risk Management Programmes approved by NZFSA and are subject to regular performance based audit by NZFSA Verification Authority. However, exemptions allow some primary processors for the domestic market to operate under the Food Act 1981, by either complying with the Food Hygiene Regulations 1974 or implementing a registered Food Safety Programme (FSP). Secondary fish processors are not required to operate under a Risk Management Programme though many choose to do so, especially when carrying out primary and secondary processing in the same premises. Other secondary processors are

covered by the Food Act provisions. NZFSA is responsible for administering both the Animal Products Act and the Food Act. Day-to-day management of matters relating to FSPs under the Food Act is largely the responsibility of officers in Public Health Units attached to local Health Boards. The regular audit of FSPs is undertaken by independent auditors approved by the NZFSA. Territorial authorities issue licences under the Food Hygiene Regulations and monitor compliance.

New Zealand regulates food safety and truth in labelling. Truth in labelling is regulated under the Joint Australia-New Zealand Food Standards Code and the Fair Trading Act 1986. The government does not intervene to regulate matters which are perceived to be commercial risk for processors, such as managing post-harvest loss or waste. The safe disposal of waste from processing is governed at the local level by territorial local authorities under the Resource Management Act. The requirement for fish processors to produce safe food under approved and audited Risk Management or Food Safety Programmes have the spinoff of reducing post harvest losses and wastage.

Information and labelling

Pre-packaged fish products, in common with all other pre-packaged food products for retail sale or catering purposes, are required to display certain prescribed information:

- prescribed name, a name or a description of the food sufficient to indicate the true nature of the food;
- lot identification;
- name and business address in New Zealand or Australia of the supplier;
- mandatory warnings and advisory statements and declarations;
- ingredient listing;
- date marking;
- directions for use and storage;
- nutrition information panel; and
- percentage labelling, characterising ingredients and components.

The labelling requirements are common to New Zealand and Australia and set by the Food Standards Australia and New Zealand (FSANZ). NZFSA is responsible for enforcing these standards which came fully into force in December 2002. New Zealand does not require country of origin labelling.

Markets and trade

Markets

Seafood is New Zealand's seventh largest export good. Approximately 90% by value of New Zealand's seafood production is exported, with an estimated 70% of export returns from value added to seafood post harvest. Export sales were NZD 1.35 billion in 2008 and NZD 1.42 billion in 2009.

In 2009, mussels, rock lobster and hoki were the highest value export species. Earnings from rock lobster have increased by 51% from 2007 due to strong demand for live rock lobster in Hong Kong.

The New Zealand fisheries sector remains under economic pressure due to a strengthening New Zealand dollar against the US dollar and a continued increase in the

cost of fuel. This economic pressure has led the industry to further adapt and evolve its operations to maximise economic return. Industry developments in support of maximising economic return have included:

- strengthening relationships with overseas markets;
- globalising New Zealand's fishing and processing investments;
- developing co-operative relationships with fishing industries in other countries;
- using foreign charter vessels to harvest fisheries resources domestically;
- increasing fishing on the high seas; and
- researching and developing means of adding further value to processed products.

The New Zealand domestic market, which is 30% import dependent, consumes less than 10% by value of fish landed or produced in New Zealand. Access to the market is unrestricted, with imports of species not domestically produced (*e.g.* shrimps, prawns, packaged products, such as canned fish). Per capita consumption is relatively stable and growth is largely a function of general population trends.

The New Zealand Seafood Industry Council (SeaFIC) provides overarching representation of the New Zealand fishing industry. It promotes the interests of the industry by providing economic information and advice, coordination of industry resources and enhancement of the industry's profile. Promotion of seafood products in domestic and export markets is largely the responsibility of seafood producers.

A characteristic of industry change over the past few years has been the continued emergence of Commercial Stakeholder Organisations (CSOs) which are companies set up to manage issues for rights owners in particular fisheries. Currently, most commercial fisheries in New Zealand are represented by a CSO, allowing for greater integration of stakeholder views in the management of fisheries resource.

Trade

Approximately 90% of New Zealand's seafood production is exported; meaning economic return to New Zealand from the sector is heavily dependent on the nature of world markets. Improved access to high value markets will improve the value New Zealand obtains from seafood production.

In the short term, export earnings are expected to remain relatively stable. The NZD/USD exchange rate has stabilised around 0.70 in early 2010. However, the NZ dollar is forecast to fall against the US dollar to just under USD 0.60 in 2011 and 2012. Thereafter the long-term average may be closer to USD 0.65 than to USD 0.60. While export returns from the US market and market denominated in USD will increase so will the costs of fishing inputs (*e.g.* diesel).

New Zealand remains committed to the WTO negotiations under the Doha Development Agenda to strengthen disciplines on subsidies in the fisheries sector, including through the prohibition of certain forms of fisheries subsidies that contribute to overcapacity and overfishing, and to the improvement of seafood market access through the lowering of tariffs and removal of import quotas. Such improvements to the seafood trading environment are likely to reduce pressures on global fisheries and improve the return New Zealand obtains from its seafood exports.

The FTA between New Zealand and China (NZ-China FTA) entered into force on 1 October 2008. Seafood exports to China for consumption in China have attracted tariffs of over 10%. The FTA will lead to reduction and eventual removal of those tariffs over time,

leading to an expansion of high value live and chilled seafood product exports to China. FTAs were also concluded since 2008 with ASEAN and Australia (AANZFTA), Malaysia, the Gulf Cooperation Council (GCC), and Hong Kong.

New Zealand is currently involved in negotiating FTAs with the Republic of Korea, India, and, as part of the expansion of the Trans-Pacific Strategic Economic Partnership Agreement (TPP, previously known as "P4"), with Australia, Brunei Darussalam, Chile, Peru, Singapore, the United States and Viet Nam.

In November 2009, New Zealand and the European Community signed an Agreed Record of Conclusions of Fisheries Consultations on the EC IUU Regulation (1005/2008) to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing. Under the Agreed Record, the catch certificate provided in the IUU Regulation was replaced with a New Zealand catch certificate, and mutual assistance will be developed to facilitate the exchange of information and assistance between respective authorities.

Outlook

Domestically, New Zealand is at a turning point in the management of its fisheries resources. The development and implementation of fisheries plans is directed at improving the opportunities for those who utilise fisheries resources to contribute to, and participate in the management of the resource.

Improvements have been made to the QMS and the majority of stocks with sustainability and management concerns will be introduced into the QMS over time.

An increased environmental focus in the management of fisheries has developed in recent years and is expected to continue developing. This parallels with increasing global focus on environmental issues and an environmentally aware New Zealand public with strong interests in the aquatic environment.

The addition of seven new patrol vessels and improved use of information and intelligence will help New Zealand develop a clearer picture of how well fishers comply with fisheries legislation and enable better targeting of resources to any problem areas.

Allocation rights in shared fisheries remain the most contentious issue domestically and developing a framework to address this issue will be important for New Zealand in the future.

Internationally, New Zealand will continue focussing on the development of new, and strengthening existing, international fisheries bodies (*e.g.* Regional Fisheries Management Organisations).

The New Zealand fisheries sector remains under economic pressure due to a strengthening New Zealand dollar against the US dollar and a continued increase in the cost of fuel. This economic pressure will lead the industry to further adapt and evolve its operations to maximise economic return. In the short term, export earnings are expected to remain relatively stable.

New Zealand will continue to promote the liberalisation of trade in fish products within the framework of international and regional bodies such as the World Trade Organization (WTO).

Priorities for 2010-11 are as follows:

- continue to ensure sustainability and regulatory measures are based on robust information and analysis;

- develop National Fisheries Plans;
- complete framework for developing *iwi* Fisheries Plans and assist in the development of these Plans;
- develop a comprehensive set of management objectives to guide fisheries management decisions;
- develop and implement environmental standards (*e.g.* Seabird Standard, Benthic Impact Standard, Research Standard);
- increase the information base on which management decisions are made, including through fish stock assessments and the introduction of amateur catch reporting by charter boats;
- encourage environmental certification to enable the New Zealand seafood industry to respond to growing pressure for environmental sustainability;
- complete and implement the national Aquaculture Strategy;
- complete collaborative work with the fishing industry on Observer Services, Research Services, and Discarding at Sea, that will deliver greater efficiency and effectiveness of service delivery and policy;
- develop performance monitoring indicators for the Fisheries 2030;
- continue South Pacific countries' co-operation and capacity building to improve fisheries governance;
- undertake more effective engagement with stakeholders;
- implement recommendations from a recent assessment by the New Zealand Institute of Economic Research to improve policy advice prepared by the Ministry of Fisheries;
- increase consistency of the Ministry of Fisheries' work with other public service agencies, including through participation in the Natural Resources Sector Network;
- improve front line compliance capacity through an increase in the number of Honorary Fishery Officers and Field Operations staff;
- increase the Ministry of Fisheries' role in education, including on issues such as sustainability;
- undertake a regulatory review aimed at improving cost-effectiveness.

Notes

1. Those claims relating to interests prior to 1992 continue to be addressed on an *iwi*-by-*iwi* basis through the historical claims process run by the Office of Treaty Settlements.
2. *www.fish.govt.nz/NR/rdonlyres/4DD60325-CADD-4E5C-92BF-A6E17C202A54/0/fisheries2030report.pdf*.
3. *www.fish.govt.nz/en-nz/Environmental/Seabirds.htm*.
4. At this point in time only commercial users of the resource, the most significant contributors to management costs, pay cost-recovery levies.

PART III

Chapter 21

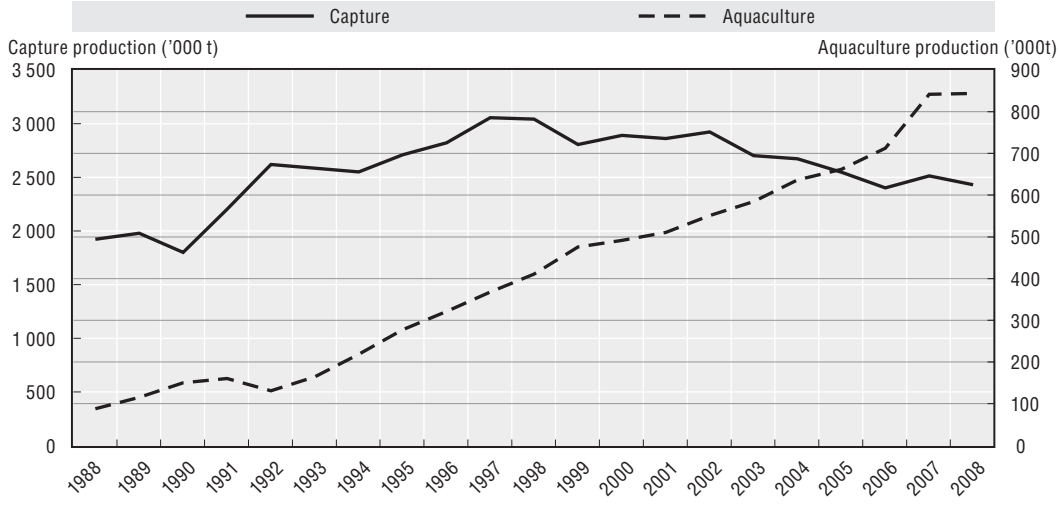
Norway

Norway

Summary of recent developments

- In 2009, Norwegian vessels landed 2.5 million metric tonnes for a value of NOK 11.3 billion. Expect for the cod and herring stock in the North Sea, redfish, blue whiting and sandeel, the state of the most important commercial fish stocks in Norway's EEZ is good.
- Aquaculture production of Atlantic salmon and rainbow trout increased from 822 870 tonnes in 2008 to 935 064 tonnes in 2009. The total value of the production of these species was NOK 16.9 billion in 2008 and NOK 21.5 billion in 2009. Farming of other marine species is modest. However, there was an increase in the sale of farmed cod from 2008 to 2009. In 2009, sale of farmed cod was 20 683 tonnes and the total value was NOK 357 million.
- In March 2007, the White Paper *The Structural Policy for the Norwegian Fishing Fleet* was presented to Parliament. It proposed management instruments to promote efficiency and profitability in the fishing fleet. The proposal was a continuation of the Structural Quota System (SQS) implemented in the coastal fleet in 2004 and the SQS in the ocean-going fleet implemented as of 2005. A time limit of 20 years on the structural quotas was re-introduced (25 years for already allocated quotas) and from 2008 the SQS in the coastal fleet was introduced for vessels between 11 and 15 metres.

Harvesting and aquaculture production (tonnes)

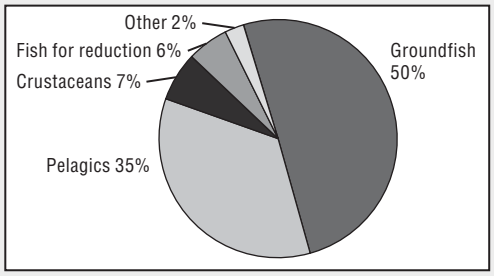


Source: FAO FishStat Database.

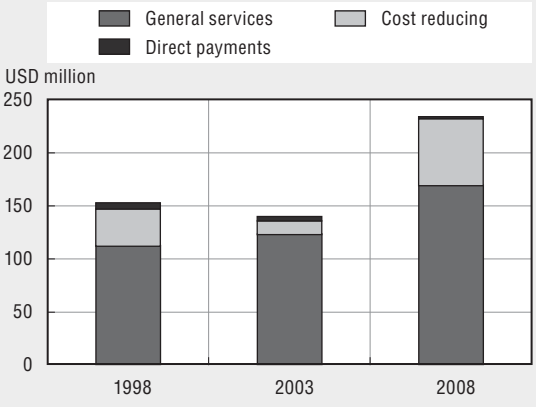
Key characteristics of the sector

- Catches of pelagic and ground fish species increased from 2008 to 2009. Prices for important species such as herring, mackerel cod and haddock have been reduced from 2008 to 2009, while the price for saithe has increased. North Arctic cod has been under particular pressure due to IUU fishing in the Barents Sea. There has been a significant reduction in IUU-fishing of cod and haddock since 2005 due to measures to combat IUU-fishing, including an entirely new scheme for Port State Control (PSC) within the North East Atlantic Fisheries Commission area.
- The total cost of fisheries management as a percentage of the catch value has increased in the last few years from about 9% in 2007 to approximately 9.4% in 2008 and 10% in 2009.
- The overall value of Norwegian seafood exports in 2009 was NOK 44.7 billion, an increase of nearly 5.9% compared to 2008. Of this, exports of caught fish account for NOK 18.7 billion and farmed fish accounts for NOK 26 billion. The government terminated *The General Agreement* from 2005, but some of the social elements have been prolonged and funding is allocated annually in the National budget. In 2009, NOK 64 million was granted by the budget.
- Employment in fisheries is decreasing, due to the implementation of vessel decommissioning schemes. The introduction of a registration fee for small coastal vessels may also act as a deterrent for new registrations for that fleet segment, while the total number of bigger vessels is conditioned by the quota system. With an average age of 25.5 years the fleet is rather old.

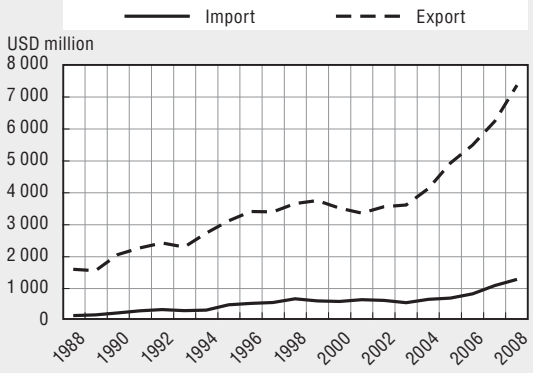
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	20 098	12 904	–35.8
Number of fish farmers	4 357	4 896	12.4
Total number of vessels	13 017	6 788	–47.9
Total tonnage of fleets	382 171	363 157	–5.0

Legal and institutional framework

The Ministry of Fisheries and Coastal Affairs is responsible for the fisheries and aquaculture industry and ports and sea transport infrastructure. Important areas of activity are as follows:

- conservation and long-term optimum sustainable utilisation of living marine resources;
- responsible management of the marine environment;
- contributing towards a profitable and efficient fisheries industry;
- regulation of the aquaculture industry;
- food safety and animal welfare;
- market access for Norwegian fish;
- maintaining a diverse fishing fleet and settlement and employment in coastal communities;
- ensuring the safety and navigability of marine traffic;
- promoting competitive sea transport.

Several administrative bodies are involved in carrying out these tasks: The Directorate of Fisheries is an advisory and executive body for the Ministry on matters concerning fisheries and aquaculture administration. Its principal tasks are: regulation, guidance, inspection, monitoring of resources and control.

The Norwegian Coastal Administration is the national agency for coastal management, marine safety and communication. The Coastal Administration is an advisory and executive body for the Ministry on issues related to ports and seaways administration.

The Institute of Marine Research advises the Ministry and carries out central tasks in the investigation and monitoring of fish stocks and marine mammals, the marine and coastal environment and work on aquaculture and sea ranching.

The National Institute of Nutrition and Seafood Research undertakes research in the field of seafood and nutrition, and advises national fisheries authorities on nutritional matters.

The Norwegian Food Safety Authority is an advisory and executive body for the Ministry of Fisheries and Coastal Affairs on matters concerning food safety, fish health and welfare.

The main legislation for the management of the fisheries and aquaculture industry are as follows:

- Act of 26 March 1999 relating to the Regulation of the Participation in Fisheries.
- Marine Resources Act of 6 June 2008 relating to the management of wild living marine resources.
- The Aquaculture Act of 17 June 2006, replacing the Fish Farming Act of 1985 and the Sea Ranching Act of 2001.
- The Food Law of 19 December 2003.
- The Animal Welfare Act of 19 June 2009.

The act regarding participation regulates who can fish for a living. A vessel may not be used for commercial fisheries unless a commercial licence has been issued. However, a commercial licence alone is not sufficient, as most of the fisheries have limited entry. Only active fishermen can own a vessel, and there is also a nationality requirement in order to own a vessel.

The purpose of the Marine Resources Act is among others to ensure a sustainable and economically profitable management of living marine resources and genetic material derived from them. The Act also states that special importance shall be given to a precautionary and ecosystem approach that takes into account habitats and biodiversity, when managing marine resources. The Institute of Marine Research (IMR) has been reorganised to take this into account.

The Aquaculture Act establishes the legal framework for all aquaculture activity. It has a strong environmental profile, while it also promotes profitability and competitiveness in the aquaculture industry. Aquaculture activities are also regulated by the Food Law. The Food Law's purpose is to promote food safety, animal health and animal welfare. Aquaculture is also governed by a number of regulations which set out rules regarding amongst others licence requirements, fish health and fish welfare, and technological standards for fish farms.

All aquaculture activities require licences. Licences for of cod and halibut rearing, mussel farming are free and can be applied for at all times while salmon and trout licences are issued in limited numbers against payment. The licences are only issued when the Government decides to do so. Anyone can apply for aquaculture licences. Regarding salmon and trout licences, a single operator is not allowed to own more than 25% of the total production capacity in Norway. Rules on ownership restrictions are drawn to ensure a differentiated aquaculture industry, with both large and small aquaculture operators.

An aquaculture licence is connected to a specific site. Each site must be authorised for aquaculture activities by local municipalities and different sector authorities, *i.e.* the Directorate of Fisheries, the Norwegian Food Safety Authority and various pollution control authorities.

There are no special regulations on foreign investment in the processing industry.

Capture fisheries

Preliminary figures indicate that total Norwegian landings increased from about 2.4 million metric tonnes in 2008 to 2.5 million metric tonnes in 2009. The total first-hand value decreased from NOK 12.2 billion in 2008 to NOK 11.3 billion in 2009. In 2007, the total first-hand value was NOK 12.1 billion. Figures for seaweed are not presented for 2008 and 2009 due to few observations (Table 21.1).

Table 21.1. **Percentage share of landed value by the Norwegian fishing fleet, 2006-09**

	2006	2007	2008	2009
Ground fish species	57.5	57.0	52.8	51.0
Pelagic fish	35.8	35.8	40.5	42.3
Shellfish	6.5	7.0	6.8	6.7
Seaweed	0.2	0.2	. .	. .
Total	**100.0**	**100.0**	**100.0**	**100.0**

The total catch of groundfish increased from 2008 to 2009 but its value decreased approximately by 11% in the same period. Between 2003 and 2007, groundfish prices increased but have declined since then.

The total catch of pelagic species increased by 5% from 2008 to 2009. Preliminary figures indicate that of the total catch, a relatively larger proportion is used for direct human consumption than for reduction purposes. From 2008 to 2009, the total first-hand value decreased by 2.5%.

Employment and fleet structure

The total number of commercial fishers in Norway decreased from 12 867 in 2008 to 12 730 in 2009. There was a reduction of 75 full-time fishers and 62 part-time fishers.

The number of fishing vessels registered in the Register of Norwegian Fishing Vessels was reduced from 6 785 vessels in 2008 to 6 507 vessels in 2009. In 2000, the number of registered vessels was 13 017. Removal of inactive fishing vessels from the Register of Norwegian Fishing Vessels and the introduction of an annual registration fee are the main reasons for the strong reduction in the number of smaller coastal vessels in this register. The structural quota system is assumed to be the main explanation for the reduction in the number of larger coastal vessels and ocean-going vessels.

The number of fishing vessels in operation decreased from about 5 800 vessels in 2008 to about 5 400 vessels in 2009. The number of fishing vessels covered by the yearly profitability survey of Norwegian fishing vessels has been relatively stable at about 1 700 vessels since 2005.

The average age of the fishing fleet is high with an estimated 25.5 years in 2008 and 2009. One hundred and nineteen new vessels were built in 2008 and 47 in 2009, most of them less than 15 metres long.

Performance of the fleet

The annual profitability study of Norwegian fishing vessels indicated that the profitability in the fishing fleet as a whole was good in 2008. Of a total of 18 vessel groups, 16 showed a positive operating profit. The total operating revenues for the fishing fleet in the population were estimated to NOK 10.9 billion, while the total operating expenses were estimated to NOK 9.6 billion. Compared to the total catch value of NOK 12.2 billion, this indicates that the population of the yearly profitability survey catches nearly 90% of the total catch value with a total operating profit of NOK 1.4 billion in 2008.

The total first-hand value was lower in 2009 compared to 2008. At the same time, the fuel and lubrication oil costs have decreased compared to 2008. It is therefore difficult to estimate the results for 2009. A general overview of the profitability of the Norwegian Fishing Fleet is provided in Table 21.2.[1]

Status of fish stocks

The scientific advice provided by the International Council for the Exploration of the Sea (ICES) in relation to total allowable catches (TACs) is fundamental to management decisions. Precautionary reference points were introduced in the advice from ICES in 1998 and have since been included in Norwegian fisheries management. In the years before the introduction of these reference points, management was mainly assessed in relation to the size of the spawning stock biomass (SSB).

However, the new precautionary reference points take into account both the size of the spawning stock (Bpa) and fishing mortality (Fpa). This implies that the management of a particular stock may be considered as contrary to the precautionary approach in cases where the spawning stock biomass (SSB) is well above the precautionary level. Partly due to

Table 21.2. **Performance of the Norwegian fishing fleet, 2006-08**

	2006	2007	2008
Registered vessels	7 300	7 038	6 785
Population[1]	1 652	1 709	1 716
Total operating revenues (million NOK)	10 823	10 853	10 948
Total operating expenses (million NOK)	9 109	9 354	9 575
Total operating profit (million NOK)[2]	1 714	1 498	1 373
Operating margin[3]	15.8%	13.8%	12.5%

1. The population consists of vessels which have landed fish at least seven months in a year, and which have an income from fishing above a specific minimum level (relative to length categories), and covers only vessels more than 8 metres.
2. Total operating profits is the economic result of the activities of the firm; defined as total operating revenues over total operating expenses.
3. Operating margin expresses how much is earned on every NOK 100 in sale. Operating margin is given as (Operating profit/Operating revenues) * 100.

this, further discussions will be held between scientists and managers when new reference points are implemented.

Table 21.3 gives the latest ICES Advisory Committee (ACOM) assessments (Spring 2010) for the most important commercial fish stocks in waters under Norwegian fisheries jurisdiction.

Table 21.3. **Status for the most important species in Norwegian fisheries**

Species	Spawning stock biomass ('000 tonnes)		Spawning stock reference point (Bpa) ('000 tonnes)	Estimated fishing mortality		Fishing mortality reference point (Fpa)
	2008	2009		2008	2009	
Demersal species						
Northeast Arctic cod	704	1 070	460	0.33	0.28	0.40
Cod in the North Sea and Skagerrak	58	69	150	0.71	0.85	0.65
Northeast Arctic haddock	181	200	80	0.36	0.31	0.35
Haddock in the North Sea and Skagerrak	210	178	140	0.23	0.23	0.70
Northeast Arctic saithe	533	457	220	0.25	0.27	0.35
Saithe in the North Sea and Skagerrak	261	263	200	0.30	0.29	0.40
Pelagic species						
Norwegian spring spawning herring	12 437	13 300	5 000	0.13	–	0.15
Herring in the North Sea and Skagerrak	1 038	1 289	1 300	0.22[1]	0.11[1]	0.12/0.25[2]
Mackerel	2 492	2 591	2 300	0.24	–	0.23
Barents Sea capelin[3]	330	517	[4]	[4]	[4]	[4]
Blue whiting	4 749	3 588	2 250	0.29	–	0.32

1. Age groups 2-6 years.
2. F = 0.12 for age groups 0-1 year, F = 0.25 for age groups 2-6 years.
3. Maturing biomass.
4. Due to its special population dynamics, *i.e.* it dies after spawning, precautionary reference points for the SSB and fishing mortality are not relevant for capelin.

Access

Consultations on bilateral fishing arrangements for 2008 and 2009 were held with Russia, the European Union, Iceland, the Faroe Islands and Greenland. The objective of these fisheries negotiations is to agree on TACs and a fair distribution of quotas to develop a reasonable balance in reciprocal fishing possibilities. Norway is also party to a trilateral agreement with Greenland and Iceland on Capelin, a coastal state agreement on blue

whiting with Iceland, Faroe Islands, and the European Union, and a coastal state agreement on mackerel with Faroe Island and the European Union. Since 2007 exists a coastal agreement between Norway, Russia, the European Union, Faroe Island and Iceland on the Norwegian Spring Spawning herring.

Norway also participates in regional management commission in the Northwest Atlantic (NAFO) and Northeast Atlantic (NEAFC). In Tables 21.4 and 21.5, the quotas allocated to Norway in the zones of other countries and quotas allocated to other countries in the Norwegian economic zone in 2008 and 2009 are presented.

Table 21.4. **Quotas allocated to Norway specified on different economic zones, 2008-09**

Agreement (between)	The economic zone of/area	Total Norwegian quotas (all species, tonnes)	
		2008	2009
Norway and Russia	Russia	166 000	164 700
Norway and European Union	EU North Sea and west of 4° W	521 879	396 324
	Greenland	8 694	8 894
Norway and the Faeroe Islands	Faeroe Islands	23 283	18 875
Norway and Greenland	Greenland	2 775	2 760
Norway and Iceland	Iceland	500	30 531
Norway, Greenland and Iceland	Jan Mayen/Iceland/Greenland	31 0561	0[1]
Norway and European Union (Sweden and Denmark)	Skagerrak/Kattegatt	16 635	14 795
NAFO	NAFO (3M)	–	–
NEAFC	Irminger Sea	4 141	5 291

1. Quotas for the 2007-08- and 2008-09-seasons

Table 21.5. **Quotas allocated to other countries in the Norwegian economic zone and in the fishery zone around Jan Mayenn, 2008-09**

Allocated to	Area[1]	2008	2009
Russia	North of 62 °N and in the fishery zone around Jan Mayen	398 362	556 401
EU	North of 62 °N and in the fishery zone around Jan Mayen	123 528	136 037
	North Sea[2]	482 396	338 718
Faeroe Islands	North of 62 °N and in the fishery zone around Jan Mayen	54 226	89 772
	North Sea	40 353	38 372
Greenland	North of 62 °N	6 035	11 365
	North Sea	1 035	1 035
Iceland	North of 62 °N	225 228	244 265
European Union (Sweden and Denmark)	Skagerrak/Kattegat	115 079	103 651
Sweden	North Sea	4 211	4 211

1. Some fish species can be fished either north or south. The quotas are included only once where the most likely to be fished and apply mostly mackerel but also herring.
2. Included Sweden.

In addition to the exchange of quotas, the agreements between the countries involved also include licensing arrangements for vessels fishing in other countries economic zones.

Management of commercial fisheries

Most commercial stocks in Norwegian waters are shared with other countries. TACs and national quotas for these stocks are determined through international negotiations.

The Norwegian part of the TAC is divided into quotas for each vessel group. Each group quota is shared between vessels within the group.

Each vessel is regulated with Individual Vessel Quotas (IVQs) with a quota level guaranteed to a vessel or at a level which implies a moderate competition between vessels. Guaranteed IVQs mainly apply to vessels holding a licence/annual permit and competitive quotas apply mainly to smaller coastal vessels. Table 21.6 lists TACs and national quotas in 2008 and 2009 for some of the most important species in Norwegian fisheries.

Table 21.6. **TACs and national quotas in 2008-09 for some important species in the Norwegian fisheries**

Species	The economic zone of or area	Agreement between Norway and	TAC ('000 tonnes)		National quota ('000 tonnes)	
			2008	2009	2008	2009
Cod	North of 62° N[1, 8]	Russia	451 000	546 000	202 413	244 100
	North Sea	European Union	22 152	28 798	3 384	4 514
	Skagerrak	European Union	3 165	4 114	102	133
Haddock	North of 62° N[2, 8]	Russia	155 000	194 000	78 500	97 050
	North Sea	European Union	46 444	42 110	7 375	7 978
	Skagerrak	European Union	2 856	2 590	120	109
Saithe	North of 62° N[8, 9]		247 000	225 000	226 130	204 150
	North Sea	European Union	135 900	125 934	68 376	63 186
Herring	North of 62° N[3, 8, 9]	[4]	1 518 000	1 643 000	925 920	1 002 230
	North Sea West of 4° W	European Union	201 277	171 000	57 068	48 368
	Skagerrak	Sweden, Denmark	51 673	37 722	6 892	5 032
Capelin	North of 62° N	Russia				
	Iceland, Jan Mayen and Greenland[5]	Iceland, Greenland	308 000		39 325	
Mackerel	North Sea, North of 62° N and west of 4° W[8, 9]	European Union	134 387		120 450	131 965
Blue whiting	International waters	[6]	1 250 000	590 000	394 858	202 353
Redfish	Greenland NEAFC	European Union NEAFC			3 500	3 000
Shrimp	Skagerrak	Sweden, Denmark			5 415	5 415
	Greenland	European Union			3 250	3 500
	NAFO	NAFO			1 985[7]	1 985[7]

1. Norwegian coastal cod included.
2. Norwegian coastal haddock included.
3. Norwegian spring spawning herring.
4. Due to a coast stat agreement between EU, Norway, Iceland, Faeroe Islands and Russia.
5. Quotas for the 2007-08- and 2008-09-seasons.
6. Due to agreement between EU, Norway, Faeroe Islands and Iceland.
7. "Days at Sea".
8. Quotas for research and education purposes are included.
9. Quotas for bait are included.

The national quota of mink whale was set to 1 052 animals in 2008 and 885 animals in 2009. 27 vessels participated in the hunt in 2008 and 22 vessels in 2009. The quotas for harp seals in the Barents Sea were set to 10 000 in 2008, 0 in 2009 and 7 000 in 2010. In the areas around Jan Mayen, the quotas for seals were 31 200 in 2008, 40 000 in 2009 and 42 400 in 2010. In addition, there are quotas on coastal seals for recreational hunt only. Respectively, one and three vessels participated in the commercial hunt for seals in 2008 and 2009.

When mink whaling was resumed in 1993, all participating vessels were required to have an inspector onboard during whaling. Most inspectors were practicing veterinary surgeons. The inspection scheme resulted in considerable public costs as well as for the individual whalers. In order to reduce costs, work commenced in 2001 on the development of a recorder which could replace the inspectors. In 2004, a provisional version of the

recorder was introduced, and the number of inspectors was reduced at the same time. Today, all vessels that participate in whaling are fitted with a voyage recorder ("blue box").

All vessels participating in seal hunting were required to have inspectors on board to ensure that their hunting activities were performed in accordance with regulations.

A vessel may not be used for commercial fisheries unless a "commercial licence" has been issued. However, a commercial licence alone is not sufficient, as most of the fisheries have limited entry. However, some fisheries are remained open for new entrants who fulfil some basic requirements.

Only fishers are permitted to own fishing vessels in Norway, but dispensations have been granted to allow some industrial corporations to vertically integrate into the catch sector. A person must fulfill a number of criteria to be registered as a fisher. These criteria have been established to achieve the political objective that the ownership of fishing vessels and thus the right to exploit Norwegian fisheries resources shall be exclusively given to active fishers.

The right to buy a fishing vessel can only be given to a Norwegian citizen or a body that can be defined as a Norwegian citizen. A company is regarded as having equal rights with a Norwegian citizen when its main office is situated in Norway and the majority of the Board, including the Chair of the Board, are Norwegian citizens and have been in the country the last two years. Norwegian citizens also have to own a minimum of 60% of the shares and must be authorised to vote for at least 60% of the votes.

Participation is limited by annual permits (coastal fleet) and licences (ocean going fleet) in combination with Individual Vessel Quotas (IVQ). The Norwegian quotas are allocated to different vessel groups. The quotas are then distributed between the vessels holding the necessary licences to participate in the groups. Approximately 95% of the landed value of fish is regulated through annual TAC. The authorities can withdraw permits and licences if conditions are not met and can also allocate new licences and permits.

Licences and annual permits are not tradable as they are issued to and associated with a given vessel. When vessels are traded, the licence and annual permit follow the vessel when permission has been granted, with certain restrictions, by the authorities.

Two basic models, licences and annual permits, are implemented for regulating the number of vessels that can join the various fisheries. The difference is basically that licences are granted for an unlimited time-span, while the fishing permits are limited to one year. In reality however, annual permits are renewed indefinitely, if the objective criterion are met each year.

As indicated in Tables 21.7 and 21.8, a vessel may hold several different types of licenses or annual permits. A vessel may or may not participate in all fisheries for which it is licensed. Table 21.7 indicates that the number of vessels holding one or more licenses declined by only one vessel from 2008 to 2009. Table 21.8 illustrates that the number of vessels holding one or more permits has decreased from 2008 to 2009. Vessels down to 11 metres with a permit were included in the Structural Quota System from 2008.

Regulatory instruments for capacity adjustment

The traditional instruments to reduce fishing capacity and numbers of vessels have been state funded decommissioning schemes. From the early 1980's different schemes for transferring quotas between vessels have been available in the long distance fleet, including

Table 21.7. **Type of fishing licence, the number of licences and fishing vessels with licence in Norwegian fisheries, 2008-09**

Type of licence	Number of licences	
	2008	2009
Purse seine	80	80
Blue whiting	46	46
Norwegian spring spawning herring with trawl	31	29
Pelagic trawl/North Sea trawl	44	42
Capelin trawl	127	130
Mackerel trawl	29	27
Cod trawl	43	42
Saithe trawl	9	9
Shrimp trawl	79	77
Other licences	44	44
Total number of licences	**532**	**526**
Number of vessels	269	268

Table 21.8. **Type of annual permits, the number of permits and fishing vessels with permits in Norwegian fisheries, 2008-09**

Type of annual permit	2008	2009
Northeast Arctic cod/saithe/haddock, vessels < 28 m	2 021	1 982
Northeast Arctic cod/saithe/haddock, vessels ≥ 28 m	38	36
Northeast Atlantic mackerel	458	446
Shrimp (southern areas)	151	149
Norwegian spring spawning herring	402	386
Saithe seine (northern areas)	161	157
North Sea herring	95	93
Saithe seine (southern areas)	60	60
Cod (southern areas)	60	60
Permits-regulated purse seiners	17	17
Total number of permits	**3 463**	**3 386**
Number of vessels	2 495	2 440

the Unit Quota System (UQS). The UQS allows the owner of two vessels to transfer the quota of one vessel to another and to fish the entire quota on one vessel for a fixed period. The length of the period and the scrapping conditions varied throughout the years.

From 2004 on, a Structural Quota System (SQS) and a new decommission scheme partly funded by the industry were implemented in the coastal fleet to reduce capacity. Unlike the UQS there were no time limitations for the transferred quotas. In 2005, a SQS based on the coastal fleet model was implemented for the long distance fleet. To avoid concentration of quotas, the SQS schemes were subject to certain limitations.

A Fund for Decommissioning of Fishing Vessels up to 15 metres holding annual permit(s) was established on 1 July 2003. The scheme is described under the section on government financial transfers.

As licenses of the scrapped vessels were withdrawn and redistributed to the remaining home-based vessels, the aim of the fund was to improve the profitability of the

remaining vessels. The various market-like instruments available to the fishing fleet have all been actively used by the industry.

Before the introduction of these measures the access to all important fisheries for the coastal fleet were closed; a process that accelerated in 2002 and 2003. Since 2004, the coastal fleet activities in all important fisheries were regulated by annual permits combined with Individual Vessel Quotas (IVQ).

In June 2007, the Parliament approved to continue the SQS for the coastal and long-distance fleet, although with some modifications. The SQS for the coastal fleet was extended to include vessels between 11 and 15 metres, and a time limitation of 20 years on the structural quotas was re-introduced (25 years for already allocated quotas). It was also decided to terminate the decommissioning scheme on 1 July 2008 (prolonged to 2009) and to evaluate the introduction of structural quota for the vessels between 11 and 15 metres.

The evaluation of the introduction of the structural quotas concludes that this system has been more effective than the decommissioning scheme and there was little geographical redistribution of fishing rights.

Technical regulations

Norway introduced a ban on discards in 1987 as part of a larger, comprehensive package of policies by which Norway tries to minimise the discard problem. The most important technical measures are mesh size, selectivity rules, restrictions on the use of trawls and other gears, area and seasonal closures, by-catch rules, minimum sizes, sorting grids and discard ban. The main objective is to promote an exploitation pattern where recruits and undersized fish are spared, and where unwanted by-catch can be minimised. All together these measures secure a sound management of marine resources.

Advice from ICES indicates that the stock situation for North Sea cod is still critical, and that the level of discard is too high. Therefore, the European Union and Norway have agreed on a number of measures to reduce discards. The European Union introduced a ban on high grading from 2009. Norway and the European Union agreed to implement a joint system for Real Time Closures (RTC) of fishing grounds in the North Sea. The aim is to protect juveniles and under-sized fish, as well as to reduce unwanted by-catch. The system entered into force 1 September 2009. From a Norwegian point of view, the system needs to be further improved.

Norway has also introduced the following in Norwegian waters:

- Norwegian requirement that vessels fishing in Norwegian waters have adequate quota that match expected catch composition.
- Norway has increased the minimum size for cod, haddock, saithe and whiting in the Norwegian economic zone south of 62° N. The purpose is to lower the threshold for the Coast Guard when establishing precautionary areas in the North Sea.
- Norway has strengthened the rules governing discard of fish caught by foreign vessels in the Norwegian Exclusive Economic Zone. We have introduced a requirement that all fish that are caught in Norwegian waters, also by foreign vessels, must be taken to port, regardless of which final port is used. Vessels discarding fish caught within Norwegian waters risk losing their license.
- The use of sorting grid in small mesh trawl fishery when fishing for blue whiting and Norway pout.

Since 1980, the Directorate of Fisheries has conducted an annual programme to remove nets and other gears. The areas that are cleared are selected after consultations between the fishing industry and the fisheries authorities, and based on information from the fishers about loss of nets. Between 1983 and 2009, 13 150 nets were retrieved. In addition, a substantial amount of anchors, grapnels, trawl wires and line were collected. Most nets are lost in deeper fishing areas between 200 to 800 metres, but also in cod fisheries in relatively shallow waters.

The current ICES advice on Norwegian coastal cod north of 62° North is to set a zero TAC. However, the TAC system for cod (Northeast Arctic and Coastal) does not restrict the overall catches of coastal cod. The Norwegian coastal cod north is recognised as a stock complex. Genetic studies indicate that some of the spawning components along the coast could be local stocks, more or less isolated from coastal cod in neighbouring areas. The challenge for the management is, therefore, both to keep the total stock complex at a productive level and, in addition, to give protection to potentially vulnerable local stocks. Special regulation measures for local stock components are taken in accordance with scientific advice.

Trawl fishing for cod is not allowed inside the 6-nautical mile line except for about ten trawlers which in a few areas are allowed to fish between the 4- and 6-mile line from 15 April to 15 September.

Since the mid-1990s the fjords in Finnmark and northern Troms have been closed for fishing with Danish seine. Since 2000, the large longliners have been restricted to fish outside the 4-nautical mile line. To achieve a reduction in landings of coastal cod additional technical regulations in coastal areas were introduced in May 2004 and continued with small modifications in 2005 and 2006.

In the new regulations fjord-lines are drawn along the coast to close the fjords for direct cod fishing with vessels larger than 15 metres. A box closed for all fishing gears except hand-line and fishing rod is defined in an area where spawning concentrations of coastal cod is usually observed and where the catches of coastal cod have been high.

Further restrictions were introduced in 2007 by not allowing pelagic gillnet fishing for cod and by reducing the allowed bycatch of cod when fishing for other species inside fjord lines from 25 to 5%, and outside fjord lines from 25 to 20%. The regulations were maintained in 2008. In addition, in 2009 one more spawning area was closed for fishery (except for hand line and fishing rod).

A system with more strict regulations inside fjords than outside fjords will be continued and these objectives are incorporated in a proposal for a rebuilding plan for coastal cod. This plan was accepted by ICES.

Management of recreational fisheries

Recreational fisheries at sea are regulated by the Act of 6 June 2008 on the management of wild living marine resources. The Act gives the authorities the ability to regulate recreational fisheries by foreign tourists as well as by Norwegian citizens.

The recreational fisheries by Norwegian citizens are regulated by gear restrictions such as handline, rods, nets with a total length of 210 metres, longline with maximum 300 hooks and maximum 20 pots or traps. Each recreational fisherman may combine these types of gears according to the number of gears listed. Norwegian citizens may sell the fish through the sales organisations.

The Act gives the fisheries authorities the possibility to introduce other limitations such as quotas for recreational fishers. From 2005, a recreational fisher may realize sales up to a maximum of 2 000 kg of cod. This will be reduced to 1 000 kg for 2011 as a part of the measures to rebuild the coastal cod.

Foreign tourists may only use handline or rod. Tourists are not allowed to sell the catch. In June 2006, there was introduced an export quota on fish and fish products for personal travellers. The quota limits the amount of fish a person can bring out of Norway to 15 kg plus one trophy fish.

Since 6 June 2008, tourists are allowed to join professional fishers on fishing boats. There are no exports limits on fish caught by tourists on these trips as long as the catch is being written off the fishermen's quota and the tourists has a contract note showing this when crossing the Norwegian boarder. As the catch must be written off the fisher`s quota, the fishing is sure to be within sustainable bounds.

The last decades there has been an increased commercial activity in tourist enterprises along the coast facilitating for organised fishing by Norwegian and foreign tourist. This activity puts pressure on the coastal fisheries recourses. The Ministry of Fisheries and Coastal Affairs has therefore appointed a working group in 2010 with a mandate to consider and propose measures to regulate commercial activity related to tourist fishing. The working group is expected to submit proposals in 2011.

As regards recreational fisheries in rivers and lakes the fisheries for salmon and trout are regulated by the Act of 15 May 1992 relating to Salmonids and Freshwater Fisheries. As a general rule, anadromous salmonids are protected unless otherwise determined. Regulations permit fishing for anadromous salmonids in rivers and lakes with rod and handline during fishing seasons decided by the county governor. There are different fishing seasons for different areas and rivers.

Aboriginal fisheries

Norwegian fisheries authorities acknowledge an obligation to maintain a traditional Sami fishery, which is mainly carried out in the coastal area in northern Norway. The policy is to fulfil this obligation within the existing fisheries management system. When special measures are taken, the criteria for qualification are geographical or connected to the common boat size among Sami fishers rather than an ethnic criterion.

Adjustments in the rules for the register of professional fishers have been made to make it easier for Samis with traditional ways of living and working to be registered. This was accomplished by extending the limit for maximum income from activities other than fishing in the actual geographical area.

In June 2006, a committee was appointed to consider the rights of Samis to fish resources off the coast of the northern most county, Finnmark. The committee delivered its report on 18 February 2008. The report is now for consideration in the Ministry, and the Ministry is in consultations with the Sami Parliament. The Government is expected to present proposals to the Norwegian Parliament in 2011.

Monitoring and enforcement

In order to manage the different fisheries properly, an extensive system to control the fishing activity and the fishing fleet has been established. The control and enforcement

system in Norway has three cornerstones: The Coast Guard, the Directorate of Fisheries and the Sales Organisations.

The most important sources of information, in order to control the fishing activity are logbooks and sales notes. All vessels longer than 13 metres are subject to the logbook provisions. From 1 October 2010 on, all vessels longer than 21 metres are subject to electronic logbooks and from 1 January 2011, all vessels between 15 and 21 metres will also be subject to electronic logbooks. The smaller vessels (13-15 metres) have to fill in a simplified version of the logbook. Electronic logbooks will be required for EU-flag state vessels above 15 metres from 1 January 2011.

The logbooks are a primary source for the monitoring of a vessel's fishing activity checking facts such as live weight of catches by species and the exact position and fishing time of each fishing operation.

The sales note is a contract between the fishers and the buyers. For the authorities, this document is the basis for keeping accounts of catches in relation to quotas. On the basis of the information from sales notes, the authorities are able to estimate when a quota is exhausted and stop the fishing activity accordingly.

Vessels from third countries are subjected to the same rules as Norwegian vessels when fishing in Norwegian waters, *i.e.* with regard to rules for by-catch, discard, logbooks and use of technical devices such as sorting grids.

Foreign vessels fishing in the Norwegian EEZ and onboard-producing Norwegian vessels are obliged to send regular catch reports to the Directorate of Fisheries who is operating the Norwegian system for activity and catch reports. The vessels must send a message containing information of the catch onboard specified by species and what time the vessel has entered into the Norwegian EEZ (active code).

In addition, the vessels must send catch reports to the Directorate of Fisheries on a weekly basis. The vessels must also notify authorities when they have completed their fishing activity and are about to leave the Norwegian EEZ (passive code).

The Norwegian fisheries authorities have established seven checkpoints north of 62° N and three flexible checkpoint areas in the North Sea for the purpose of controlling foreign vessels in the Norwegian EEZ. Foreign vessels are obliged to notify the system for quota control in the Directorate of Fisheries no later than 12 hours before arriving at the checkpoint.

Norway decided with effect from 1 July 2010 to require satellite tracking of all fishing vessels over 15 metres. This equipment automatically transmits the vessel's position, course and speed each hour, 24 hours a day, regardless of where in the world the vessel is located.

Similarly, foreign fishing vessels fishing in Norwegian waters are subject to satellite tracking. The general rule is for vessels with an overall length exceeding 24 metres. However, due to the bilateral agreement between Norway and the European Union, mutual tracking of vessels above 15 metres has been required from 1 July 2005. Fighting IUU-fishing has been high on the Norwegian Governments agenda for several years, and Norway has taken an active and broad approach towards these challenges on a national and international level.

The Norwegian national advisory group against organised IUU–fishing was created in 2009. The purpose of this project is to establish a closer cooperation between different Governmental agencies in the work against illegal, unregistered and unreported fishing. The project is co-operation between the Ministry of Fisheries and Coastal Affairs, Ministry

of Defense, Ministry of Justice and the Ministry of Finance. These ministries, in addition to the Higher Prosecuting Authority, are represented in the projects steering committee. The project is a network of professional analysts from the Directorate of Fisheries, Norwegian Coast Guard, Police, the Taxation Department, the Custom department and the Norwegian Coastal Administration.

Multilateral agreements and arrangements

Norway actively promotes the work of developing global binding instruments to combat IUU-fishing. In November 2009, a FAO-agreement on port state control was signed as a major step to reduce IUU-fishing globally. In addition, Norway has endorsed and fully implemented the regional scheme for port state control adopted by NEAFC, and has entered new bilateral arrangements with other countries in the field of resource control in the fisheries.

Another important aspect for Norway is to work for the international recognition of illegal fishing as transnational organised crime. Norway is of the opinion that there exists clear links between different types of transnational organised crime and organised IUU-fishing. Norway raised this issue during the twelfth United Nations Congress on Crime Prevention and Criminal Justice in Salvador, Brazil in 2010.

The United Nations Office on Drugs and Crime (UNODC) is, with economic support from Norway, working on a study on transnational organised crime in the fishing industry. The report is to be finalised early 2011.

Norway is also concerned about the illicit money flow of the proceeds of illegal fishing through the use of tax havens. Furthermore, as OECD has pointed out several times, Norway would like to focus on the link between flags of convenience and tax havens in order to achieve greater transparency relating to ownership and control of fishing vessels. These issues were raised in the Task Force on Financial Integrity and Economic Development during the conference in September 2010.

Norway is also active in the process of developing international guidelines to reduce discards and by-catch in FAO. The 28th annual meeting of the Northeast Atlantic Fisheries Commission (NEAFC) adopted a ban on discards in international waters on the major stocks regulated by NEAFC as a major contribution to the work towards sustainable and responsible management of fisheries in the high seas**.**

Norway is also a member of the Convention of the Conservation of the Antarctic Marine Living Resources (CCAMLR), the South East Atlantic Fisheries Organisation (SEAFO), the North Atlantic Marine Mammal Commission (NAMMCO) and the International Whaling Commission (IWC). Norway became a member of The International Commission for the Conservation of Atlantic Tunas, ICCAT, in 2004.

Aquaculture

Farmed fish represents more than 55% of the total export value of fish and fish products in Norway, even though it represents only 31% of the total production volume. Atlantic salmon is by far the most important specie. Rainbow trout is the second most important specie, while farming of other marine species are modest. The aquaculture industry is governed by a number of laws and regulations. The most important acts are the Aquaculture Act, the Food Law, the Pollution Control Act, the Harbour and Fairway Act and the Animal Welfare Act.

The Aquaculture Act entered into force on 1 January 2006, replacing the Fish Farming Act (1985) and the Sea-Ranching Act (2001). The main purpose of the new act is to promote end enhance the profitability and competitiveness of the aquaculture industry within the framework of sustainability and to contribute to value creation on the Norwegian coast. In the Aquaculture Act, focus has shifted from regulating ownership of licences to regulate management of the installations. The licences are transferrable and it is possible to mortgage them. This development is a reflection of the evolving aquaculture industry.

All farming of fish and shellfish and sea ranching requires a license from the Norwegian authorities. For aquaculture of Atlantic salmon and rainbow trout there is also a system of limited entry. These licences are allocated through special allocation rounds. The main components of the licence consist of the right to produce specific species, in a specific quantity at specific sites.

The emphasis on environmental and disease-controlling measures has resulted in regulation of the operation and installation of aquaculture facilities. This regulation also restricts the use of antibiotics in fish farming and addresses the handling and disposal of dead fish. The license holders are required to keep logbooks on the amount of fish in the cages, the number of dead fish and escaped fish and the amount of antibiotics and chemicals used in the production. In case of disease, the license holder is obliged to keep records on the type of disease, the number of fish infected and the location of the fish.

The Norwegian Food Safety Authority monitors the presence of fish diseases. The Norwegian Food Safety Authority operates laboratories along the coast to test fish quality and to measure if there are residues of illegal amounts of extraneous matters in fish. Introduction of effective vaccines in addition to improving operating routines has nearly eliminated the use of antibiotics in salmon farming. Antibiotics-use was reduced from approx 50 tonnes in 1990 to approximately one tonne in 2009. Within the same time span the salmon and trout production increased from less than 150 000 tonnes to approximately 900 000 tonnes.

There are also several measures to prevent escape of farmed fish, one of which is a technical standard for the aquaculture installations. The Government has also established protected areas where aquaculture activity is limited in the most vulnerable fjords and waterways, called National Salmon Fjords, in all 29 fjords and 52 waterways.

Most Norwegian sea-farms are open cage systems located along the coast. This kind of system has proven to be the most cost-effective. Each salmon and trout licence normally covers two or three locations. The purpose of giving the licence holder more than one location is to reduce the risks of disease and local environmental pollution. There is still room for expansion of the aquaculture industry along the Norwegian coast line. Tables 21.9 and 21.10 summarise the Norwegian aquaculture industry in 2008 and 2009.

In 2009, 2 843 persons were registered as employed in the production of fish, breeding stock, as well as research and education, of Atlantic salmon and Rainbow trout. In the hatchery and juvenile production of Atlantic salmon and Rainbow trout 1 305 persons were employed. During the period 2002 until 2005, there was a decline in the number of persons employed. Since 2006, this trend has been reversed.

Farming of other marine fish species is modest. In the last years unused licenses for the production of other marine fish species has been withdrawn by the authorities to release the area for other purposes. This explains the decrease in the number of licenses

Table 21.9. **Types of licences granted and active licences in the Norwegian aquaculture industry, 2008-09**

Type of licence	Number of licences		Number of active licences	
	2008	2009	2008	2009[1]
Sea-farm, Atlantic salmon and rainbow trout	991	1 061	922	986
Juvenile, Atlantic salmon and rainbow trout	285	256	220	214
Other marine species	678	591	285	253
Shellfish and crustaceans	537	456	283	271

1. Preliminary figures.

Table 21.10. **Sales (volumes and value) and employment in the Norwegian aquaculture industry, 2008-09**

Type of licence	Sale				Employment	
	Volume (tonnes/1 000 pieces)		Value (NOK mill)			
	2008	2009[1]	2008	2009[1]	2008	2009[1]
Sea-farm, Atlantic salmon and rainbow trout	822 960	935 147	16 864	21 504	2 730	2 843
Juvenile, Atlantic salmon and rainbow trout	239 343[2]	250 533[2]	1 986	2 174	1 216	1 305
Cod	18 052	20 683	372	357	289	283
Other marine species	5 341	2 207	212	152	192	153
Shellfish and crustaceans	2 053	1 727	14	13	352	281

1. Preliminary figures.
2. Numbers are in 1 000 pieces.

for production of other marine fish species from 2008 to 2009. However, there was an increase in the sale of farmed Atlantic cod from 2008 to 2009.

Unused licenses for shellfish have been withdrawn by the authorities over the last years, which explains the decrease in the number of licenses. During the same period, there was also a decrease in the sale of shellfish.

Development in the profitability in the farming of Atlantic salmon and rainbow trout (Table 21.11) depends on the development in the output prices. From 2006 to 2008, there was a significant reduction in the profitability compared to the exceptional high level of 2006. Historically, the Norwegian fish farming industry has displayed considerable increases in its productivity. In 1995, production per man/year was only 152 418 kg while production per man/year in 2008 was estimated to 402 027 kg.[2]

Table 21.11. **Performance of the Norwegian fish farms with production and sale of Atlantic salmon and rainbow trout, 2005-08**

	2005	2006	2007	2008
Total operating revenues (Million NOK)	15 599	20 452	19 637	20 395
Total operating expenses (Million NOK)	12 012	14 314	17 003	18 526
Total operating profit (Million NOK)[1]	3 587	6 138	2 634	1 869
Operating margin[2] (%)	23.0	30.0	13.4	9.2
Average production costs per kg (NOK)	13.80	14.74	15.91	18.17

1. Total operating profit is the economic result of the activities of the firm; defined as total operating revenues over total operating expenses.
2. Operating margin expresses how much is earned on every NOK 100 in sale. Operating margin is given as (Operating profit/Operating revenues) * 100.

Fisheries and the environment

The socioeconomic importance of fisheries and aquaculture in Norway is reflected in the authorities' efforts to establish policies for securing well functioning marine ecosystems both along the coast and within Norway's EEZ. The introduction of ecosystem based management plans is an important part of this. In 2006, the government submitted a White paper to the Norwegian parliament about a new, integrated management plan for the Barents Sea and the areas off the archipelago Lofoten. In 2009, the government submitted a White paper about an integrated management plan for the Norwegian Sea. It is expected to finalise an integrated management plan for the North Sea within 2013.

These management plans balances the various interests for use of the area with an aim to secure among others; a sustainable harvest of the marine living resources, secure biodiversity, secure safe shipping activities and allow for the exploitation of the oil and gas resources of the area.

Coastal zone management is a high priority. The challenges in the coastal zone are to ensure harvesting of resources and use of the coastal area for a multitude of activities as well as ensuring a healthy environment and resource base for future generations. Each county and local municipality is urged to work out a coastal zone management plan if they regard it necessary. The fisheries authorities participate in the planning process on the local level.

Norway has ratified the Convention on Biological Diversity (CBD) and is obliged to conserve the biological diversity and to ensure sustainable use of the components of biological diversity. The Marine Resources Act states that special importance shall be given to a precautionary approach that takes into account habitats and biodiversity, when managing marine resources. Fish stock rebuilding primarily takes place under this Act. However, threatened and endangered marine species can be prioritised according to the Nature Diversity Act. The scope of this act is up to 12 miles off shore.

Norway is the first country to have implemented protection measures for cold-water corals in European waters. In Norway, especially large amounts of the cold-water coral Lophelia have been detected, including the world's largest known Lophelia-reef, the Røst-reef.

In 1999, Norwegian fisheries authorities established a regulation for the protection of cold-water coral reefs against. The regulation prohibits intentional and negligent destruction of coral reefs and requires precaution when fishing in the vicinity of known cold-water coral reefs. Further, the regulation gives special protection to some particularly vulnerable coral reefs by totally banning the use of fishing gear which is dragged along the bottom and may come in contact with the reefs in these specially protected areas.

So far eight reefs have been given this kind of special protection. In addition, the world's shallowest known Lophelia-reef, *Selligrunnen*, rising up to 39 m depth below the surface, has been temporary conserved pursuant to the Norwegian Nature Conservation Act (2000).

Norway has also been active in promoting area management in NEAFC. The need to conserve vulnerable deep-sea habitats and species has been high on the NEAFC agenda in recent years, and since 2004 NEAFC has adopted a series of measures to protect Vulnerable Marine Ecosystems (VMEs). The latest development was in 2009, when NEAFC decided to close five areas on the Mid-Atlantic Ridge in the high seas in the North East Atlantic to bottom fisheries in order to protect VMEs from significant adverse impacts. The closure makes up 355 300 km^2 and 7.3% of the NEAFC regulatory area south of Iceland.

NEAFC has also adopted operational procedures on how fishing vessels should handle encounters with vulnerable ecosystems. These adoptions are all elements in NEAFCs implementation of the UNGA fisheries Resolution 61/105.

A sustainable development in the marine areas is not only dependent on responsible fisheries management, but is equally dependent upon responsibility within other activities that affect the marine environment. The fisheries authorities thus attach high importance in co-operation with other sector authorities and the environment authorities to reveal harmful effects of various activities and to prevent discharge of hazardous substances into the sea.

An important feature of ecosystem based management is the interaction between fish and marine mammals. Marine mammals are a renewable resource and also an important component of biological diversity in marine ecosystems. They must therefore be included in a coherent ecosystem-based management regime for Norwegian waters.

The emphasis on environmental sustainability is also reflected in the management of the aquaculture industry. In 2009, the Norwegian Government launched a *Strategy for an Environmentally Sustainable Norwegian Aquaculture Industry*. The strategy was devised in co-operation with the industry and is an important tool for the Government and the industry, in defining indicators for environmental sustainability.

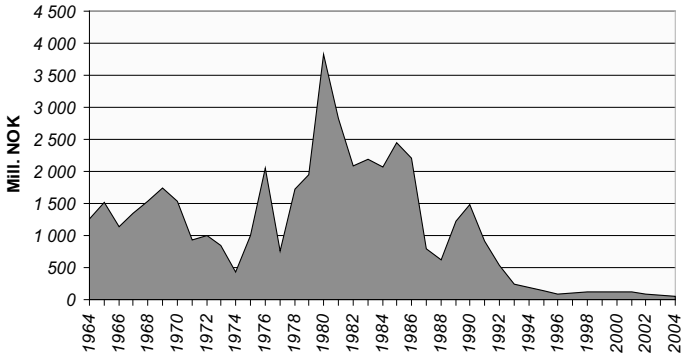
As part of Norway's efforts to implement the ecosystem approach to the management of its marine resources, a White Paper on Norway's Policy on Marine Mammals was presented to the Parliament in 2009. The White paper proposed a continuation of a coherent and active management regime for marine mammals based on modern principles for the management of species, habitats and ecosystems. In 2009, the Norwegian Government launched their Strategy for an Environmentally Sustainable Norwegian Aquaculture Industry. The Strategy identifies and discusses the industry's environmental challenges and sets out a number of goals on how to ensure an environmentally sustainable aquaculture industry. Furthermore, it explains how to reach the goals. The main goals in the Strategy are related to: genetic interaction and escapees; pollution and discharges; diseases, including parasites; and zoning and feed and feed resources.

Government financial transfers

The General Agreement between the Norwegian Government and the Norwegian Fishermen's Association was signed in 1964. The purpose was to ensure that through government financial support, fishers would reach the same income levels as the average industrial worker. Since 1990, support through this scheme has been reduced significantly, from NOK 1.4 billion (nominal value) in 1990 to NOK 90 million in 2002 and NOK 70 million in 2003. The Norwegian Government terminated the General Agreement from 1 January 2005. Some of the elements of the Agreement have however been prolonged, including an income support scheme, transportation support and support to the sealing industry.

The minimum wage scheme to fishers was kept during 2008 and 2009. This scheme is established to support fishermen when the income from the fishing activity is insufficient, due to reasons beyond the fisher's influence, such as long periods of bad weather, extraordinary ice conditions, etc. The weekly pay depends on how much one has received over this scheme during the past three years compared to maximum payable amount. Recipients of funds from this scheme are basically fishers on smaller vessels with lower activity levels. In 2008, NOK 3.4 million was paid out through this scheme, while the

Figure 21.1. **Development of the economic transfers to the capture industry and the General Agreement (monetary value adjusted to 2002 prices)**



amount in 2009 was NOK 13 million. The increase in 2009 was mainly a consequence of temporary changes in the scheme due to the financial crisis.

The transportation support scheme is established to reduce cost disadvantages caused by geographical or structural conditions. The support item is important to maintain a differentiated fishing fleet, and to secure supplies to the processing industry in vulnerable regions. Support is given for transportation of fish from areas with excess supply to areas with excess demand and from areas where there are no landing facilities. In 2008, NOK 29 million was allocated through this scheme, and in 2009 the amount was NOK 43.1 million. The increase in 2009 was mainly due to increased transportation of unprocessed fish in order to manage challenges in sales caused by liquidity problems.

Support to the Norwegian sealing industry is given to improve the profitability of the industry. According to the Norwegian interpretation of an ecosystem-based management regime, sealing is considered a necessity. Hence, a profitable industry is an essential basis for rational and sustainable harvesting of marine mammals, and support is given as an incentive for sealers to catch the current quota.

Sealskins are the main income source of sealing. However, prices are insufficient to make the industry profitable. The government has during the last few years allocated funds to research and development projects of seal products. Funding has also been allocated to collaboration with Russian harvest communities in the White Sea area.

In 2008, one vessel participated in the Norwegian sealing, receiving NOK 2 million in support. In addition NOK 8 million was allocated to the landing facilities, collaborative projects for sealing in Russia and for research and development purposes. In 2009, the figures were NOK 6.2 million and NOK 3.8 million respectively, and three vessels participated in the Norwegian sealing this year.

A new Fund for Decommissioning of Fishing Vessels with an overall length up to 15 metres was established in 2003. The scheme was funded through a 0.35% fee on the landing value of every Norwegian fishing vessel in 2003, 2004 and 2005, and then reduced to 0.05% in 2006 and 2007. The programme was initially terminated 1 July 2008. The fee for the first six months of 2008 was 0.18%. The government transferred NOK 5 million to the fund in 2006 and 2007, and NOK 11.25 million in 2008. The programme was extended to 1 July 2009 due to remaining funds from 2008.

The total cost of fisheries management as percentage of the catch value has increased the last few years from about 9% in 2007 to approximately 9.4% in 2008 and 10% in 2009. This is mainly due to decreased catch values and increased costs of general services (Table 21.12).

Table 21.12. **General services: The capture sector ('000 NOK)**

	2007	2008	2009
Ministry of Fisheries	32 477	28 957	36 070
Membership in international organisation	8 647	7 895	6 698
Institute of Marine Research	217 399	248 758	239 119
Operations of research vessels	117 667	139 196	111 842
Directorate of Fisheries	189 215	207 875	224 775
Coast guard	507 213	505 537	522 151
Total	**1 072 618**	**1 138 218**	**1 140 655**

Post harvesting policies and practices

Following the EEA-agreement (European Economic Area) and the subsequent obligation to implement relevant EU-regulation pertaining to sanitary standards in the food processing industry, Norway has adopted both EU-legislation on animal health issues, and EU-safety and quality legislation related to the production of seafood. Since 1999, this also includes the adoption of the EU border control regime for fish and fishery products originating from countries outside the EEA-area.

The Norwegian fish processing industry has implemented self-check systems based on the principles of HACCP as advised by the *Codex Alimentarius* Commission. The self-check systems cover both food safety and quality aspects, and are audited by the Food Safety Authority. Commercial standards are, however, developed and supervised by the seafood industry. Norwegian authorities have used substantial resources to implement this system to ensure the quality of products.

The Norwegian Food Safety Authority, which was established on 1 January 2004, is responsible for seafood safety and quality, as well as fish health and welfare. The Authority was set up following a merger of the Norwegian Animal Health Authority, the Norwegian Agricultural Inspection Service, the Norwegian Food Control Authority, the Directorate of Fisheries' Seafood Inspectorate, and local government food control authorities.

In relation to countries outside the EEA emphasis has been put on obtaining bilateral agreements with food safety and quality control authorities in countries representing important markets. One reason for this is an increasing demand for sanitary certificates for the export of fish and fish products to emerging markets.

With respect to labelling, the Norwegian government focuses on the development of international quality standards and conformity assessment systems. It is important to ensure that technical regulations and standards, including packaging and labelling requirements, do not create unnecessary obstacles to international trade. Furthermore, to avoid confusing and misleading consumers, information and labelling need to be clear and trustworthy.

Markets and trade

The domestic market is an important and profitable market for the fishing industry. A survey on domestic consumption has been conducted since 1995 in order to provide

reliable data. In 2009, Norwegians consumed 23 kg per capita of fish and fish products (approximately 35 kg round weight). The age group of 60+ years has the highest consumption of seafood.

Through marketing activities financed by the fisheries industry, the *Norwegian Seafood Export Council* (NSEC) aims to develop markets for Norwegian seafood at home and abroad. The NSEC's activities encompass marketing and PR, gathering information on market access, information and provision of emergency response. The council has its main office in Tromsø, as well as subsidiaries in France, Germany, Spain, Portugal, Italy, Brazil, Japan, China and Russia. The NSEC operates under the Fish Export Act of 1990 and the Fish Export Regulation of 1991 and in 2010 its budget was NOK 330 million.

Total exports of seafood from Norway increased from 2008 to 2009, and in 2009 the total export value amounted to NOK 44.6 billion, which is an increase of more than 10% compared to 2008. The quantity of exports increased from 2.3 million tonnes in 2008 to 2.6 million tonnes in 2009. As in previous years, the most important export market for Norwegian salmon was the European Union, with a 59% share of total exports. Asia and Eastern Europe, with Japan and Russia as the most important markets for Norwegian exporters of seafood products, however displayed more growth than the European Union, while the largest increase was seen in the US market. As regards the main products' share of total export value for seafood, the share of farmed salmon and trout increased from 51% in 2008 to 59% in 2009, whilst groundfish stood for 11% of export value and pelagic products for 18%.

As of 2005, the European Free Trade Agreement (EFTA) states have signed free trade agreements with South Korea, Egypt, Colombia, the Gulf Cooperation Council, Canada, Peru, Ukraine, Albania and Serbia and are in negotiations with Bosnia Hercegovina, India and soon Russia. Norway is also negotiating a bilateral FTA with China. The agreements ensure improved market access for Norwegian exports of important fish and fish products. Once they enter into force, these agreements will have a positive impact on fish trade and investments in the fishery and aquaculture sector.

Following an anti-dumping and subsidy investigation initiated by the European Commission in the autumn of 2004, a permanent anti-dumping measure against farmed salmon was adopted in the European Union, Norway's most important market for seafood, in January 2006. The measure was challenged by Norway under the WTO Dispute Settlement Understanding. A panel report, published in the summer of 2007 ruled in favour of Norway. The measures against Norwegian salmon were terminated in July 2008.

The mandate for the Doha Development Round, *i.e.* negotiations on broad round of trade talks in the WTO, was established in 2001. The negotiations ground to yet another halt in July 2008. As regards fisheries, Norway has major interests in market access for fish and fishery products, as well as the issues of anti-dumping rules and a new discipline for fisheries subsidies. In the autumn of 2010, there are signs of renewed interest in completing the round.

Outlook

Fisheries and environment

The implementation of the WSSD goal of 2002 of an ecosystem-based management by 2010 will focus on the following areas:

- strengthen research to increase the understanding of the structure and functioning of marine ecosystems, natural fluctuations, species interactions, and how these are affected by fisheries;
- improve scientific advice to fisheries management, taking into account ecosystem effects;
- reduce uncertainty in stock assessments;
- long-term management plans for single species (*e.g.* Northeast Arctic cod);
- improve selectivity and fishing methods to reduce unintended by-catch and disturbance to bottom habitat.

A selection of the coral reefs is protected against all threats as part of a national representative network of marine protected areas. As knowledge about sea floor structures and bottom habitats in Norwegian waters is very limited an ongoing research programme, MAREANO, is dedicated to a systematic mapping of the sea floor, its biological structures and biology.

The Marine Resources Act is a new and comprehensive framework for the management of all living marine resources, taking the ecosystem approach into account. The Act also strengthens regulations on resource control in several areas and will permit Norwegian authorities to impose regulations on the use of tracing to ensure that all fish produced and sold are legally caught. Norway will continue to work for the conservation of vulnerable deep sea habitats and develop operational procedures on how fishing vessels should handle encounters with vulnerable ecosystems.

The outlook for the traditional fishing industry seems good, with an improved stock situation for most stocks except for the cod and herring stock in the North Sea and sandeel, blue whiting and redfish in the Norwegian exclusive Economic Zone. In addition, no IUU-fishing of cod was registered in the Barents Sea in 2009 and the establishment of a global binding agreement for port state control and the development of international guidelines to reduce discards and by-catch is in good progress.

The traditional fishing industry has been through a period characterised by many bankruptcies due to low prices and unfavourable exchange rates. As a consequence, the capacity of the fishing industry should now be better adapted to the current resource base and profits are expected to increase for individual enterprises. It is difficult to predict future prospects for the whitefish market. Norway exports around 95% of the harvested fish, but exports are dependent on demand in the important markets of Spain, Portugal and Italy. In addition, the cod quota will increase in 2011 and increase the supply of Barents Sea cod. This can also influence prices.

In the fishing fleet, the new structural adjustment instruments implemented from 2008 will provide efficiency and profitability, and make the fleet robust to handle increased fuel prices and keep up with generally productivity growth and increased competition. Fuel prices have risen considerably in recent years with the result that the

more expensive fuel will lead to less pressure on stocks, less pressure on the ecosystem, and lower emissions of greenhouse gases.

The revisions of the Structural Quota System and the Decommissioning Scheme from 2004 will form the basis for the future evolvement and need of regulatory instruments in the fishing fleet. Due to the continually increasing productivity in fisheries, Norwegian fisheries authorities must consider and assess different instruments to ensure profitability and efficiency in the fleet.

Norway will continue to actively promote reducing IUU-fishing globally and the development of international guidelines to reduce discards and by-catch.

The globalisation of the trade of fish and fish products means that Norwegian production will meet with stronger competition on the world market. This is especially the case for the filleting industry in the north of Norway as it competes with the whitefish sector. Products of hake and pollock can be produced at lower prices in countries where labour is cheaper. Globalisation is a challenge to the processing sector, which must improve technologically to increase its efficiency.

Trade in fish and fish products is one of the most protected sectors in the world trade. Average tariffs for fish and fishery products are, in many countries and in many important markets for Norwegian exports, considerably higher than tariffs for other industrial goods. Such barriers are important constraints for further growth of the aquaculture as well as the wild capture fishing industry in Norway. Anti-dumping measures in the European Union and the United States against the Norwegian aquaculture industry are an example of non-tariff barriers.

Norwegian exporters of seafood are highly dependent on good and predictable market access. Therefore, the WTO-negotiations are of high priority for Norwegian fishery authorities. The objective is to eliminate or reduce tariffs and non-tariff barriers globally. Free trade agreements through EFTA also contribute to improving market access. As a member of EFTA, Norway has concluded 22 free trade agreements and is negotiating with more countries, both within EFTA and bilaterally.

The European Economic Area agreement regulates the conditions for the exports of seafood to the European Union. For a number of species customs duties are abolished, while for other species duties have been substantially reduced.

Partly as a consequence of the importance of market access, Norwegian authorities put great emphasis on having a good framework for sanitary and health measures to assure the protection of human, animal and plant health. Quality regulations and control is not only executed in production levels, but apply until products reach their final destination. In addition to the work in international bodies, such as the *Codex Alimentarius* Commission, Norwegian authorities work to establish bilateral agreements governing the trade in fish and fishery products, also with a number of food safety authorities of other countries.

The FAO asserts that fish resources in a global perspective are very unlikely to increase in the future, and there is a strong concern on how to ensure proper stock management and how to protect stocks in coming years. The value of aquaculture products represents more than 55% of the total Norwegian export value of seafood products. This share is expected to increase in the years ahead. In 2007, the Ministry of Fisheries and Coastal Affairs published a Strategy for a Competitive Norwegian Aquaculture Industry.[3]

To enable the industry to fulfil its potential production capacity and improve its competitive position, the authorities will continue to focus on the environment as well as disease controlling measures. To ensure that the industry does not affect the environment in an undesirable way and to control fish disease, focus will be put on the establishment and use of environmental parameters in the assignment of locations and the control of these parameters.

The profitability of farmed salmon and rainbow trout is closely linked to production costs and output prices. The profitability of the Norwegian fish farming industry has over the recent years been considered as good. In 2008, however, salmon production costs increased, mainly due to higher feed and feed resources prices and an increase in the price of smolt.

Research, development and education are important to the development of the industry. In recent years, focus has been on environmental interactions, reduction of fish diseases and development of new species. The production of salmon and trout has been and still is the dominating species of farmed fish in Norway. However, the government is also encouraging fish farmers to further develop the production of species, like cod, halibut and blue mussels. Marketing research and food quality control will be important in the years ahead.

Notes

1. More details are available on the Norwegian Directorate of Fisheries website (*www.fiskeridir.no*).
2. More details are available on the Norwegian *Directorate of Fisheries* website (*www.fiskeridir.no*).
3. *www.regjeringen.no/en/dep/fkd/Documents/rapporter_planer/Planer/2007/strategy-for-a-competitive-norwegian-aqu.html?id=478970*.

PART III

Chapter 22

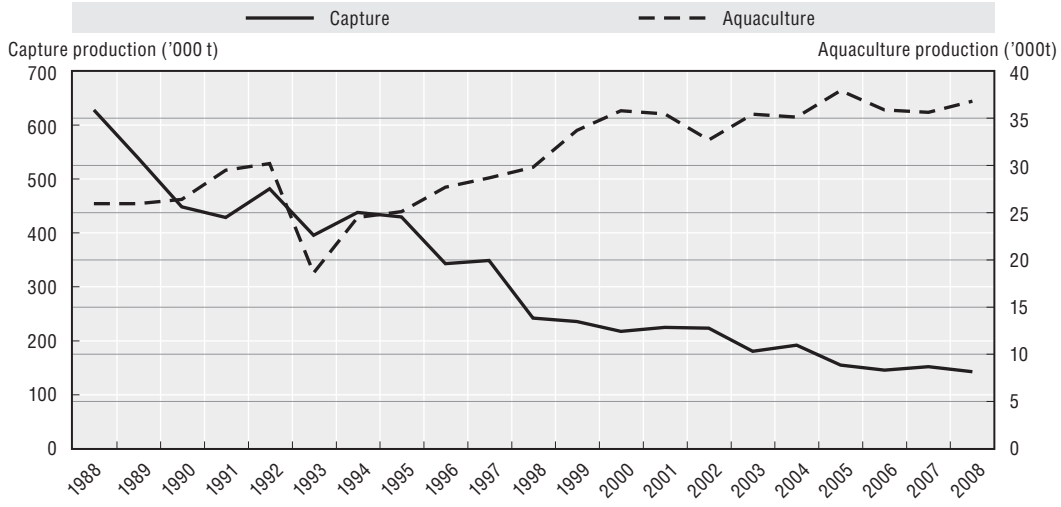
Poland

Poland

Summary of recent developments

- The capture fishery production has shown a decreasing trend over the last decades. In 2010, however, sea catches increased by 44% over 2008 due to an increase in Baltic Sea catches (22%) and deep sea catches (109.6%).
- Of the fish caught in 2010, sprat was the most common, followed by horse-mackerel.
- Polish aquaculture is based on the production of freshwater fish, among which carp and rainbow trout are the most common species.
- The fish processing sector has been almost entirely privatised and over the past several years it has become one of the most rapidly developing branches of the food processing industry.
- Poland has not reported any major changes in the management system of its fishery resources. The system is in compliance with regulations of the European Union.

Harvesting and aquaculture production (tonnes)

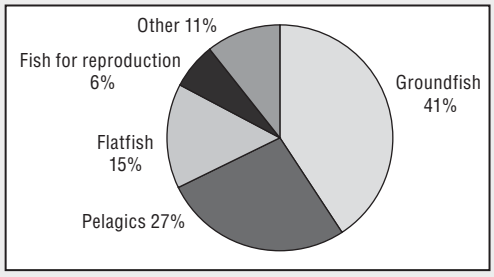


Source: FAO FishStat Database.

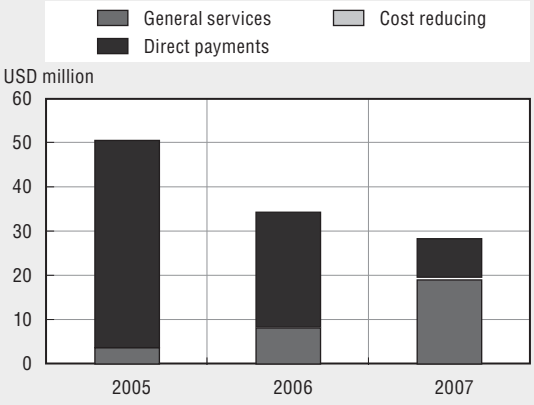
Key characteristics of the sector

- In terms of value of catch, groundfish contributed 41% of the total value in 2007, followed by pelagic (27%), flatfish (15%), and fish for reproduction (6%). Among all the species landed, cod was the most valuable species (PLN 54.4 million), followed by herring (PLN 26 million).
- In 2007, Poland provided USD 28.3 million in government financial transfers to the fisheries sector; this types of transfer has gradually decreased over the past years. Of the total amount, general services contributed 67% in 2007 whereas direct payments contributed 77% in 2006.
- Poland's trade in fish and fish products has increased significantly since 2003.
- In terms of fishing capacity, there was a substantial decrease in total tonnage of the fleet (73.4%), number of fishermen (53.2%), number of vessels (35.3%) and number of fish farmers (16%).

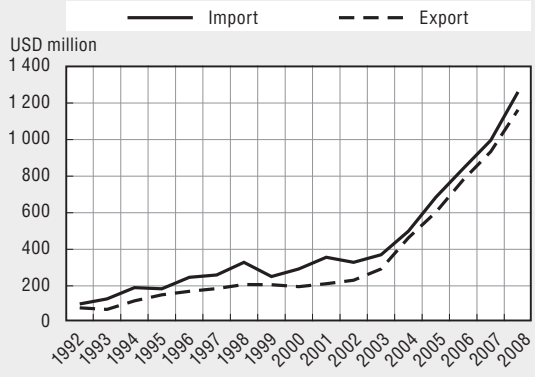
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2007	% change
Number of fishers	9 200	4 309	–53.2
Number of fish farmers	5 000	4 202	–16.0
Total number of vessels	1 295	838	–35.3
Total tonnage of fleets	117 376	31 188	–73.4

Legal and institutional framework

Fisheries management at the national level is the responsibility of the Department of Fisheries of the Ministry of Agriculture and Rural Development. It is comprised of the following units: Inland Fishery; Structural Policy; Fish Market, Sea Resources Management; Fishery Inspection and Administration; Monitoring and Reporting the Use of Assistance Funds; Technical Assistance, Information and Promotion; Fisheries Dependent Areas; Organisational and Financial; Fisheries Monitoring Center located in Gdynia.

The Department of Fisheries directly supervises the work of the three Regional Sea Fisheries Inspectorates in Gdynia, Słupsk and Szczecin. The inspectorates supervise fisheries activities at sea and in adjacent waters and monitor landings, fishing gear and manage of fishing vessel register. Inland fisheries are supervised by the corresponding local governmental administration.

Capture fisheries

Polish sea catches in 2010 totalled 181.8 tonnes – an increase of 55.8 thousand tonnes (44%) over 2008. This was the result of an increase in Baltic Sea catches (22%) and deep sea catches (109.6%).

Catches in 2010 in the Baltic and its adjacent areas constituted 64% of total Polish catches which compares with 75% in 2008. The remainder of the catch was from deep-sea fishing grounds, the most important of which is the Atlantic Ocean.

Of the species of fish and marine animals caught by Polish fisheries in 2010, sprat was the most common and comprised 38% of the total catch. In addition horse – mackerel comprised 20.4%, herring 12.2%, flat fish 6.5%, cod 5.6%, krill 3.8%. These species together accounted for 81.7% of the total marine catch.

In 2009, an estimated 26.5 thousand people were employed in the fisheries sector, a decrease of 1 500 when compared to 2007.

Table 22.1. **Polish deep-sea catches by fish species, 2008-10 (tonnes)**

Fish species	2008	2009	I-IX 2010
Saithe	1 477	1 019	932
Cod	2 090	1 192	2 115
Redfish	229.5	515	–
Halibut	1 566	1 193	565
Horse mackerel	11 724	46 228	36 892
Mackerel	1 740	4 497	676
Haddock	55	316	203
Anchovy	611	3 441	–
Sardinella	620	6 959	–
Sardines	3 012	6 777	643
Krill	8 393	8 304	6 911
Others	78	247	262
Total	**31 527**	**80 748**	**49 508**

One more deep-sea vessel was added to the fleet when compared with 2007. On 31 December 2009, Polish fishing companies owned four trawlers (21 276 GT).

Table 22.2. **Polish Baltic catches by fish species 2008-10 (thousand tonnes)**

Fish species	2008	2009	2010
Sprat	55.5	84.2	69.4
Herring	17.1	22.6	22.3
Cod	10.1	11.2	10.3
Flatfish	9.1	9.7	11.9
Salmon	0.2	0.2	0.2
Others	3.0	3.4	3.0
Total	**95.0**	**131.3**	**117.1**

Table 22.3. **Employment in the Polish fish industry 2006-07 (thousand people)**

Employment by sector	2008	2009
Fishermen	2.7	2.5
Processing	18.1	18.4
Trade	5.6	5.6
Total	**26.4**	**26.5**

At the end of 2009, Polish Baltic fisheries exploited 161 cutters, 51 fewer than in 2007. The boat fleet in 2009 consisted of 643 motor and row boats, a decrease of eight boats in comparison to 2007.

Table 22.4. **Polish fishing fleet 2007-09**

Number and capacity of fishing vessels	2007		2008		2009	
	Number	GT	Number	GT	Number	GT
Deep-sea trawlers	3	8 737	4	21 276	4	21 276
Cutters fleet (over 15 m loa)	212	17 127	197	15 725	161	12 878
Boats fleet (under 15 m loa)	651	4 099	631	1 039	643	4 093

Status of fish stocks

The status of the stocks where the Polish fleet operates is published in the yearly report of the International Council for the Exploration of the Sea (ICES) Advisory Committee and advice is provided by the Scientific, Technical and Economic Committee for Fisheries (STEFC).

Management of commercial fisheries

Baltic fisheries are managed in compliance with the regulations of the European Union. In order to protect decreasing fish resources the following measures are used: imposing catch limits, temporary restrictions for fishing activities and closed regions; protecting juvenile fish by establishing minimum sizes and net mesh sizes.

After fishing quotas are exchanged with other Baltic countries, the allowable catch in Polish sea areas and how the division of catches among fishing boats and cutters, is determined annually by the Minister of Agriculture and Rural Development and published as a regulation in the Official Journal (*Dziennik Ustaw*).

Access

Poland accession to the European Union and all bilateral agreements on fisheries are managed by the European Commission.

Management of inland and recreational fisheries

Inland water fisheries are based on the natural production potential of rivers, lakes and dam reservoirs with a total area of almost 600 000 ha.

In 2010, there were approximately 35 000 tonnes of commercial catches, including in lakes, rivers and dam reservoirs. In addition, approximately 14 300 tonnes of fish are caught by recreational fisheries. The majority of the almost 2 million active recreational fishermen in Poland are rod fishermen.

Table 22.5. **Fresh water fish production (fish marketed for consumption only) (tonnes)**

	Aquaculture				Capture inland fishery	Recreational	**Total**
	Total	Carp	Rainbow trout	Other			
2006	35.2	15.6	17.1	2.6	2.8	15.2	**55.3**
2007	35.0	15.4	17.0	2.6	2.6	13.8	**51.4**
2008	34.2	15.2	16.0	2.6	2.4	12.9	**49.5**
2009	35.1	18.3	14.1	2.8	2.4	14.4	**51.9**
2010	35.0	16.6	15.2	3.2	2.3	14.3	**51.6**

Aquaculture production

It is estimated that 4 200 people work in aquaculture sector.

Polish aquaculture is based on the production of freshwater fish throughout the country. Ponds are supplied with surface waters, the amount and quality of which limit the production. Polish law does make provision for preferential water access for fish farms. Permits are required to use surface waters, which are the property of the state. The majority of Polish pond production involves two fish species, *i.e.* approximately 16 600 tonnes of carp and over 15 200 tonnes of rainbow trout were produced in 2010.

Government financial transfers

Up to 1 May 2004, the state provided the fisheries sector with the following types of aid: subsidies for purchasing deep-sea fishing licenses for trawlers; subsidised loans for the purchase and storage of raw fish material; VAT and fuel excise tax exemptions for fishing vessels; interest subsidies for investment loans under the Sectoral Programme of Fisheries Development in Poland between 2000-06; funding the stocking of Polish sea areas and inland waters. After 1 May 2004, only fuel excise tax exemptions are applied.

The maximum allowable fishing effort for the Baltic fleet was laid out in the Ministry of Agriculture and Rural Development regulation as the number of fishing vessels permitted to fish in the territorial seas and the adjacent Szczecin and Vistula lagoons. New vessels can be put into service if a vessel with a comparable fishing capacity is scratched from the register. Total vessel length, width and motor power are used to determine comparability.

Withdrawal of excessive fishing potential began after Poland's accession to the European Union according to the provision of Sector Operational Plan "Fish and Fish processing 2004-06" (Dz. U., No. 197, item 2027).

Post-harvesting policies and practices

Processing and handling facilities

At the end of 2010, 250 companies complied with EU hygienic and veterinary standards and had permits to export to EU countries. In addition, 350 plants were allowed to supply local markets.

The fish processing sector has been almost entirely privatised and, over the past several years, has become one of the most rapidly expanding branches of the food processing sector. The greatest number of fish processing firms, approximately 144 (58%), are located in coastal areas.

Table 22.6. **Fish processing in 2008-10 (tonnes)**

Product group	2008	2009	2010
Fresh and frozen whole and gutted	28.7	25.4	25.5
Fresh and frozen fillets	46.7	41.9	38.0
Salted fish	21.0	19.7	19.5
Smoked fish	77.4	75.1	79.5
Canned fish	62.3	60.5	67.0
Marinated products	79.3	98.1	92.0
Other products	36.9	17.5	20.0
Total human consumption products	**371.5**	**255.3**	**366.0**

Markets and trade

Markets

Trends in domestic consumption

In 2010, Alaska pollack dominated the consumption of fish. Supplies were slightly lower than in 2008 with a per capita consumption of 2.93 kg. Herring was the second most common species consumed (2.63 kg). A 40% decrease in the consumption of pangasius (3.09 kg in 2008 in comparison to 1.86 kg in 2010) is noted.

The estimated supply of fishes to the Polish market in 2010 was 509 800 tonnes, which means that the average per capita consumption was about 13.35 kg in live weight equivalent. These figures are lower than those for 2008 – 566 500 tonnes and 14.85 kg of consumption.

Promotional efforts

The promotion of fish and fish products is limited in Poland and advertising campaigns are provided by the Sector Operational Plan, in a course entitled "Fish and Fish processing 2004-06", or sponsored by large companies at their own cost.

Table 22.7. **Estimated average consumption of fish species in Poland in 2008-10 (live weight equivalent)**

Fish species	2008	2009	2010
Alaska pollack	3.33	3.07	2.93
Pangasus	3.15	2.73	1.86
Herring	2.30	2.49	2.63
Mackerel	0.98	0.85	0.76
Sprats	0.74	0.79	0.66
Tunas	0.44	0.37	0.49
Carps	0.47	0.51	0.48
Hake	0.39	0.39	0.46
Salmon	0.45	0.74	0.66
Flatfishes	0.33	0.30	0.38
Crustaceans	0.27	0.23	0.25
Cod	0.05	0.42	0.50
Other	0.15	0.27	0.20
Total	**14.85**	**13.41**	**13.35**

Trade

Volumes and values

Import of fish and fish product into Poland in 2010 totalled 457 000 tonnes. This is an increase of 32 000 tonnes (7.5%) in comparison 2008, at a substantially higher value increase of 21.9% (EUR 189 million).

Imports of fish product into Poland were dominated by raw fish material and semi-processed products, such as frozen fish, fillets and fish meat, which require further processing. The greatest amount of fish (mainly raw fish material) was imported from EFTA countries. A sharp increase of import from China was noticed. Herring was the most frequently imported species comprising 21% of the imported fish.

In 2010, Polish export of fish and fish products totalled 316 000 tonnes. This was 84 000 tonnes (36%) more than in 2008. The value of the total export increase was about 25% (EUR 200 million).

Over 84% of the fish and fish products were exported to EU countries; Germany, France, England, the Netherlands and Denmark were the biggest markets. Salmon, cod, herring, sprat and horse mackerel were the most exported fish species (65%).

Table 22.8. **Import of fish products by species, 2008-10**

Fish species	2008		2009		2010	
	'000 tonnes	EUR million	'000 tonnes	EUR million	'000 tonnes	EUR million
Herring	97.0	115.6	88.9	104.4	95.0	109
Salmon	75.8	264.6	88.4	312.8	105.0	458
Pangasus	44.5	72.0	27.9	41.3	26.0	40
Mackerel	36.1	41.4	32.9	36.3	31.0	32
Alaska pollack	38.2	61.2	35.1	61.5	34.0	59
Cod	23.2	67.3	27.4	53.8	33.5	58
Tuna	12.2	31.5	8.6	21.9	11.5	25
Shrimps	5.9	21.6	5.8	17.3	6.1	19
Hake	8.0	17.4	7.1	13.6	8.5	17
Saithe	7.0	13.5	9.9	20.1	7.7	20
Haddock	3.5	9.7	6.7	12.2	7.0	13
Tilapia	3.8	9.3	4.0	7.3	8.0	16
Others	69.7	138.5	73.2	143.9	83.7	159
Total	**425.0**	**863.6**	**415.9**	**846.4**	**457**	**1 052**

Table 22.9. **Export of fish products by species, 2008-10**

Fish species	2008		2009		2010	
	'000 tonnes	EUR million	'000 tonnes	EUR million	'000 tonnes	EUR million
Herring	55.6	110.4	46.6	92.7	45.0	90.0
Salmon	40.2	354.2	41.9	362.4	55.0	520.0
Cod	17.6	92.5	14.9	64.5	17.0	75.0
Spratt	32.9	17.3	57.2	21.2	46.0	23.0
Trout	4.5	35.5	4.3	33.6	4.3	34.0
Mackerel	4.9	6.5	7.2	9.0	5.8	8.1
Shrimps	2.0	19.6	2.2	14.5	2.2	15.0
Horse mackerel	11.7	11.9	46.1	33.5	44.0	25.0
Alaska pollack	4.5	10.3	4.0	10.6	4.1	11.5
Sardines	6.7	6.4	15.4	10.6	11.0	12.0
Others	51.9	135.2	79.8	177.9	81.6	185.4
Total	**232.5**	**799.8**	**319.6**	**830.7**	**316.0**	**999.0**

PART III

Chapter 23

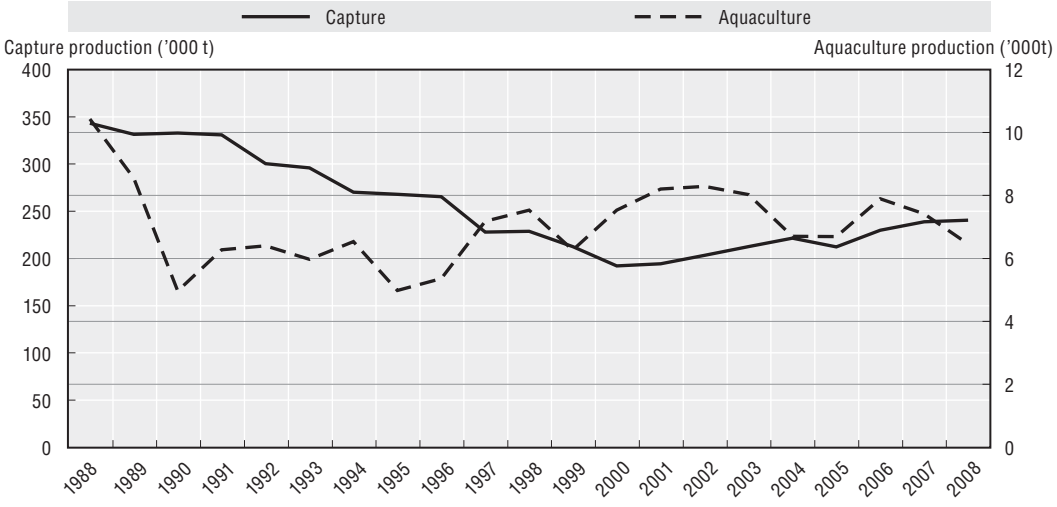
Portugal

Portugal

Summary of recent developments

- As a member of the European Union, Portugal is resuming work on the gradual application of an ecosystem-based approach to fisheries management, first by supporting environmentally-friendly policies that help preserve biodiversity, and second by fostering social and economic stability in coastal communities. The Common Fisheries Policy, amended in 2002, incorporated the underlying principles of this approach, attaching greater importance to the sustainable exploitation of living resources in line with informed scientific opinion and calling for precautionary measures in the management of fisheries and aquaculture.
- Measures taken by the government over the period 2008-09 centre on Portugal's Operational Fisheries Programme for 2007-13, for which the European Commission has approved a grant from the European Fisheries Fund. The latter is the main operative instrument for the strategy set out in the National Strategic Plan for fisheries over the same period.
- In the course of 2009, the CSF III programmes were completed and work on implementing the PROMAR measures stepped up. It should be pointed out that changes were made in some areas in order to mitigate the adverse impact of higher fuel prices.

Harvesting and aquaculture production (tonnes)

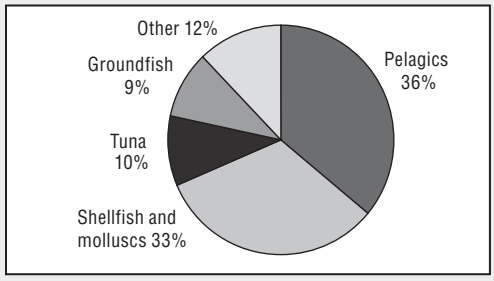


Source: FAO FishStat Database.

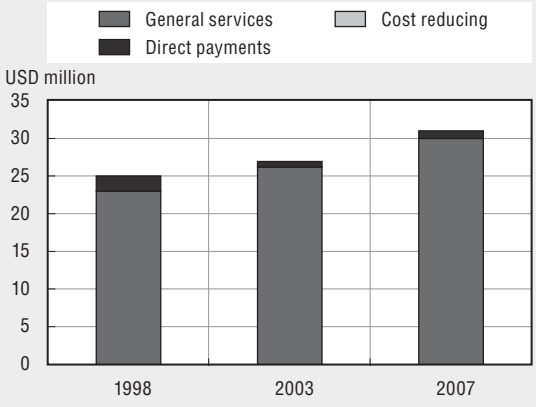
Key characteristics of the sector

- In 2009, national fisheries production from national and international fishing zones amounted to around 189 000 tonnes, a decrease of about 11% from the previous year.
- The years 2008-09 saw the continuation and completion of the Operational Programme for Fisheries 2000-06 (MARE) devoted to the sustainable development of the fisheries sector. This programme was part of the third Community Support Framework (CSF III) covering the period 2000-06.
- Portugal continues to be the European Union country with the highest annual per capita fish consumption (59 kg per capita per year, live weight). In 2009, the Portuguese trade balance in fisheries products showed a deficit of over EUR 721 million, a slight decrease from 2008.
- On 31 December 2009, the registered national fleet comprised 8 562 vessels, with a total tonnage of 104 018 GT and total engine power of 379 369 kW. Compared to 2008, there is a 0.3% decrease in vessel numbers, a 2.3% decline in gross tonnage (GT), and a 1% decrease in total engine power (kW), all of which shows that the fleet remained much the same.

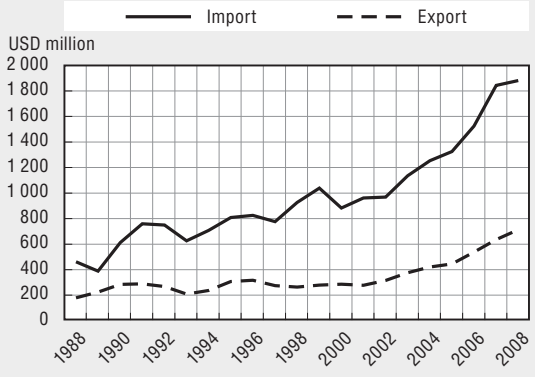
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	25 021	16 854	–32.6
Number of aquaculturalists	. .	15	. .
Total number of vessels	10 711	8 585	–19.8
Total tonnage of fleets	115 645	106 516	–7.9

Institutional and legal framework

The Ministry of Agriculture, Rural Development and Fisheries is the governmental body responsible for determining national policy for the fisheries sector, which encompasses maritime fisheries, aquaculture and the fish processing industry.

The main government agencies involved are the General Directorate for Fisheries and Aquaculture, which co-ordinates and implements policy, and the Regional Directorates for Agriculture and Fisheries, which assume the executive functions.

The legal framework for fisheries and aquaculture was set out in Legislative Decree No. 278/87 of 7 July 1987, amended by Legislative Decree No. 383/98, of 27 November 1998. The framework provisions governing fisheries were supplemented by Regulatory Decree No. 43/87 of 17 July and republished in Regulatory Decree No. 7/2000 of 30 May 2000 as amended by Regulatory Decree No. 14/2000 of 21 September 2000.

Catch sector

Performance

In 2009, national output of fisheries products, both from national waters and external fishing zones, amounted to around 189 000 tonnes (live weight, including discards and by-catches). Despite the slight increase in frozen fish, the overall figure was down by around 11% on that of previous year, mainly because of the 12.8% decrease in fresh and chilled fish, which accounts for 85% of the total volume of landings.

Furthermore, there was a sharp decline in the amount of fresh and chilled fish landed by foreign vessels in ports in mainland Portugal, which was down 9.1% in 2009 compared with 2008.

In 2009, landings in national ports of fresh and chilled products from national waters amounted to more than 144 million tonnes, with a value of around EUR 254 million, representing a fall of 14.9% in the volume of nominal catches and 13.7% in value compared with the previous year. Crucial factors in the nationwide decline were the fall in marine fish output (down 14.8% in quantity and 6.3% in value), particularly sardines and mackerel. Mollusc harvests also fell (down 0.6% in quantity and 38.8% in value), largely because of the drop in the volume of octopus caught (down 40.7%). Crustacean output rose (up 64.1% in volume and 6.2% in value) mainly because of an increase in prawn harvests.

In 2009, the reduced volume of catches nationwide was due to reduced output, not only from the continental fisheries (down 15% in volume and 13.7% in value), but also from the Autonomous Regions (down 18.1% and 7% in the Azores and Madeira respectively). In the latter, the overall decline was due mainly to a decrease in catches of the regions' more important species, notably tuna in the Azores and black swordfish in Madeira. At the national level, annual average prices at auctions were also found to be slightly higher in 2009 than in the previous year (up 2.7%).

The overall rise in prices was due to higher prices on the continental mainland (up 2.7%) and in the Azores (up 6.1%), where there was a notable increase in the price of sardines and tuna (up 9.3% and 41.7% respectively). Madeira, on the other hand, saw a decrease in prices, notably those of the tuna species, with an average decrease of 7.7%.

On 31 December 2009, the registered national fleet comprised 8 562 vessels, with a total tonnage of 104 018 GT and a total engine power of 379 369 kW. A comparison with 2008 figures reveals a 0.3% decrease in vessel numbers, a 2.3% decrease in gross tonnage

(GT), and a 1% decrease in total engine power (kW), all of which shows that the fleet remained much the same.

Stock status

In terms of quantity, the dominant species caught by the Portuguese fleet were small pelagic fishes such as sardine. This species has a very short life cycle and abundance is variable, depending on environmental conditions that influence the level of reproduction. Octopus, prawn and squid, among others, have the same type of life cycle, and thus abundance also varies considerably.

Biological assessments carried out by the International Council for the Exploration of the Sea (ICES) in the North-East Atlantic and by other international scientific authorities paint an unfavourable picture of the state of certain resources exploited by Portugal, notably hake, angler fish and langoustine.

In 2010, the ICES listed 17 stocks around the Iberian peninsula, four of which were overfished (a species of megrim, a species of angler fish, hake and anchovy, the last two being outside safe biological limits).

For the main species examined by the ICES in Portuguese waters, the situation was as follows.

- Iberian hake was subject to a recovery plan established by Council Regulation (EC) No. 2166/2005 of 20 December 2005. Despite the slight recovery of biomass due to good recruitment in recent years, stocks were still below the limit laid down in the recovery plan.
- Langoustine populations on the continental shelf were also subject to a recovery plan provided for under theabove Regulation. Over the previous few years fishing mortality levels among the main langoustine stocks (functional units 28 and 29, South and South-West of Portugal) had declined as a result of reduced fishing. Recruitment and reproductive biomass had been restored to the levels recorded in the eighties.
- Catches of anglerfish (white and black) had fallen in recent years to levels below historical maximum levels. Recommendations to reduce fishing activity were intended to restore reproductive biomass, particularly that of the white anglerfish.
- Megrim (four spotted megrim or sail-fluke) levels have been stable since the nineties, although the biomass of one of the species was still below the sustainable level.
- The reproductive biomass of the Iberian sardine had fallen in recent years, but was still at a “reasonable” level owing to moderate recruitment over the previous two years.
- The ICES found other pelagic species to be fairly stable, despite uncertainty over stock delimitation and reference points in fisheries management.

There were significant deep-water resources which supported traditional fisheries and were widely distributed across the exclusively Portuguese economic zone, including the archipelagic regions. The main species fished were black scabbard fish and deep-water sharks.

Scientific opinion on deep-water resources took account of the low level of productivity characteristic of most species, which was reflected in substantial reductions in current fishing levels. In the case of the black scabbardfish, a species targeted in the continental longline fisheries, the ICES found the abundance indicators for the period 1996-2009 to be relatively stable.

The recent ban on catching deep-water sharks, despite lack of knowledge of the size of the stock, imposed further restrictions on the fleet, which tended to catch the species unintentionally while fishing for black scabbardfish.

The stock of red sea bream, a species targeted by traditional fisheries, was stable in all areas exploited.

Management of commercial fishing

To complement community legislation on resources, Portugal has adopted a series of national measures for the purpose of establishing management models designed to ensure that stocks are exploited in a way that is rational, responsible and sustainable in the long term, given socio-economic constraints.

Following an evaluation of the current situation regarding fishing practices, vessels and local fishing communities for the purpose of determining appropriate management methods, it has been found necessary to amend certain regulatory instruments, particularly those relating to gillnets, pots, trawling and dredging. Procedures for granting licences have also been adjusted, as appropriate.

Management instruments

The plan to restore stocks of hake and langoustine continued in 2008 and 2009. Following inspection of fishing practices, existing methods for exploiting hake have been modifed, while the distribution of individual quotas per vessel has been maintained in light of previous catches reported. Furthermore, as mentioned in the section on structural adjustment, plans to adjust the way certain stocks are fished have been adopted.

The adjustment plan for Greenland halibut, developed by the Northwest Atlantic Fisheries Organisation (NAFO), sought to mitigate the effects of reduced activity and reduced profitability of companies affected by the recovery plan. Given the smaller size of the fleet associated with this fishery, it was felt that vessels should not be decommissioned but that reductions should be made in other areas to ensure the viability of fishing operations.

Portugal does not authorise the exploitation of red tuna as a target species but only as a by-catch where vessels are fishing for swordfish or where it is caught in a traditional tuna trap located on the south continental shelf.

Access to resources

The national fleet mainly fishes in Portuguese waters. However, it also operates in EU waters, notably under agreements with Spain (on trawling, long-line and seine-net fishing) which involve about 60 vessels, or under border agreements.

As a member of the European Union, Portugal enjoys the fishing opportunities arising from agreements signed between the European Union and third countries, including several African countries (Mauritania, Guinea-Bissau, Cape Verde, the Comoros, the Seychelles, Madagascar, Gabon, Côte d'Ivoire, the Republic of Guinea, Mozambique, Kiribati, the Federated States of Micronesia, and the Solomon Islands). In Norwegian waters, Portugal's distant-water fleet operates under the reciprocal fishing arrangements agreed in 1980, but observes the fishing quotas (for cod and redfish) fixed by Norway in the context of the European Economic Area.

Council Regulation (EC) No. 43/2009 of 16 January 2009 set the European Union 2009 cod quota in the Svalbard area at 19 793 tonnes. However, because it did not accept the

method used to calculate the quota, Norway closed Svalbard's fisheries protection zone on 1 September when community catches had reached 19 189 tonnes, which it regarded as a more appropriate quota for Svalbard. This situation prevented the Portuguese fleet from continuing operations in Svalbard and part of the Portuguese quota – 438 tonnes – was therefore lost, with serious economic consequences for the operators concerned. Despite the efforts of Portuguese authorities, the resolution of this issue was postponed until 2010.

In 2008 and 2009, under the community fisheries agreement with Greenland, Portugal received more quotas for redfish, transferred from the quotas of other European Union member states, as provided by Council Regulation (EC) No. 2371/2002. It also had an Atlantic halibut quota of 1 000 tonnes.

The agreements renegotiated by the European Union with third countries in the course of the 2008-09 biennium reflect a new approach to partnership with nearby developing countries. The agreements provide for aid in setting a fisheries policy that will steadily increase their capacity to achieve sustainable fishing and thus help them achieve their development objectives.

In general, the agreements entered into by Portugal relate mainly to tuna in that they grant access to the main migratory fish resources (tuna species). A substantial proportion of the Portuguese surface longliners operate in the EEZs of the Cape Verde Islands, the Republic of Guinea, São Tomé, Gabon, the Comoros, and Mozambique.

Shellfish fishing by Portuguese vessels is conducted under mixed agreements in the waters of Guinea-Bissau and Mauritania and charter agreements or joint ventures in those of Mozambique.

The EC/Morocco fishing agreement is also very important for Portugal since it provides work for 14 vessels as well as a quota for the industrial fishing of small pelagics (1 300 tonnes).

Management of recreational fishing

Regulatory decree No. 246/2000 of 29 September 2000, which defined the legal framework for recreational fishing, determined that the practice would be regulated by ministerial decree in order to ensure its sustainability, particularly in ecologically sensitive zones, and to combat illicit fishing falsely claimed to be recreational.

In 2009, the law laying down specific rules for recreational fishing was revised and at present contains special provisions on recreational fishing in the protected zone off the Southwest Alentejo Natural Park.

It should be noted that the regulations forbid recreational fishing of endangered species, or species subject to a TAC or to European quotas. Recreational fishermen must respect the stipulations on minimum size applying to commercial fishing, as well as biological rest periods for certain species.

Monitoring and surveillance of fisheries

In order to cultivate a culture of compliance and tailor regulations to practical realities, the Council adopted Regulation (EC) No. 1224/2009 of 20 November 2009, which established modern procedures for inspection, monitoring, surveillance and application of the CFP provisions at all stages of the value chain.

This system replaced the legal framework defined by Council Regulation (EEC) No. 2847/93 of 12 October 1993 and, with the exception of provisions requiring implementing measures, entered into force on 1 January 2010.

The adoption of this system presented certain difficulties for Portugal in terms of the additional area to be surveyed, the financial and administrative charges arising from the new rules and the appropriateness of the measures adopted, given the technical and operational characteristics of most vessels in the national fleet.

By safeguarding the specific qualities of the national sector, whose fisheries are typically of the traditional, small-scale kind, Portugal obtained positive results by adjusting the regulatory framework of its operations. The technical requirements and procedures arising from the new measures subsequently applied only to vessels of more than 12 metres.

On the subject of taxation at sea and on land, the General Directorate for fisheries and aquaculture, in its capacity as national fisheries authority, has co-ordinated, planned and carried out a series of operations, either independently or in collaboration with the Portuguese Navy, the Portuguese Air Force, the National Republican Guard Coastal Control Unit and the regional authorities of Madeira and the Azores. These operations include tax assessment and surveillance and monitoring of maritime fisheries operations, aquaculture and related activities. They are conducted within the context of Supervision and Fishing Activity Control System (SIFICAP) and other systems designed to safeguard, conserve and manage resources.

Multilateral agreements and arrangements

Under the Common Fisheries Policy, technical measures to manage and conserve resources, as required by community bodies, continued to be used and monitored in 2008 and 2009. Over the same period Portugal participated in the work of various Regional Fisheries Management Organisations (RFMOs), such as NAFO, the NEAFC, ICCAT, SEAFO, the IOTC and the IATTC.

Generally speaking, the level of fishing activity in international waters by the coastal and distant-water fleets over the reporting period remained the same as in 2006-07.

Quotas for Greenland halibut, redfish, swordfish and prawn allocated to the Portuguese fishing fleet were not significantly amended by the different RFMOs. In the case of cod stocks in the EEZ of Norway and Svalbard, the quota was increased by about 700 tonnes.

In some areas – the North Atlantic, the zones regulated by NAFO, the Norwegian EEZ, the Svalbard zone and the Irminger Sea (ICES XIV, XII and V) – annual licensing for catching groundfish species subject to quotas was maintained. Complementarity of fishing zones was to be achieved through the allocation of transferable individual quotas and several member states transferred quotas to Portugal.

In the course of the 2008-09 biennium, Portugal thus acquired quotas for the following: redfish in the Irminger Sea, and Greenland halibut and redfish in the NAFO areas (from Germany, Lithuania, Latvia, Estonia, and Poland); Greenland halibut and redfish in Greenland waters (from Germany), Cod in Norwegian waters (from Greece, Spain, Germany and the United Kingdom); haddock in Norwegian waters (from Germany and Poland); and saithe in Norwegian waters (from Germany and the United Kingdom).

Aquaculture

Policy development

The reference period was marked by the resumption of aquaculture as a key government strategy, together with the approval of a large-scale project to exploit turbot in the Mira region, within the area defined as the pilot region for marine aquaculture, on the island of Armona (Algarve). The aim was to set up facilities for production of bass, red seabream, white seabream, meagre and bivalve molluscs (mussels, oysters and scallops).

Regulatory decree No. 9/2008 of 16 March 2008, defined the basic regulations governing the establishment of aquaculture production zones both in the sea and in a particular production zone in Armona (Algarve).

Legislative decree No. 152/2009 of 2 July 2009 laid down the animal health requirements applicable to aquaculture species and derivative products.

In the assessment process carried out under the Fisheries Operational Programme 2007-13 (PROMAR, CSF IV), special importance was attached to environmental standards, particularly those pertaining to the improvement of effluent treatment systems, use of alternative energy or innovative technologies.

Production facilities: Scale and value

Although Portugal has natural conditions suited to the development of aquaculture, output has not risen as expected and still accounts for a small proportion of aggregate national fish output. Aquaculture offers a significant alternative to the traditional fish sources and the 7.3% increase in total output for 2008 therefore represents a positive achievement for the sector.

Production in salt and brackish water is continuing its upward trend and is mainly geared to red seabream, bar and clam in seawater and trout in fresh water.

The unfavourable economic situation, which militates against the marketing of traditional species, together with poor diversification of species and products, and certification requirements for products and production processes, have hindered progress in this sector. Its competitiveness is further reduced by the predominance of small companies with limited managerial and financial capacities, which are unable to reduce production costs and invest in R&D.

In 2008, output from aquaculture amounted to 7 987 tonnes or EUR 43.2 million in value terms, up on 2007 levels by 7.3% in volume and 6.5% in value.

Production in brackish water and sea water facilities still predominates (accounting for around 88% of total aquaculture output). Fish represents 39% of the output from these facilities (red seabream and bass making up 86%) while molluscs and crustaceans represent around 49%, the main species being the clam. The Algarve region stands out from other areas, producing over 50% of the country's aquaculture output.

Fresh water production, mainly of trout, was slightly higher than in 2007.

At the end of 2008, 1 552 fresh, salt or brackish water facilities (including reproduction and rearing units) were approved, 87% of which were ponds for bivalve mollusc production, mostly located in Ria Formosa in Algarve. Production ponds for fish accounted for only 10% whereas floating structures (mainly for the production of bivalve molluscs) comprised 1.7% of all licensed facilities.

Fresh water is mainly used for intensive production. Brackish and salt water tend to be used for extensive production (mainly of bivalve molluscs) and, to a lesser extent intensive, for semi-intensive fish production.

In December 2006, under CSF III, a turbot production system was presented and will begin full production in mid-2011, thereby doubling Portuguese aquaculture output.

Fisheries and the environment

As far as development of the fisheries sector is concerned, projects designed to support the strategy pursued run counter to a wide range of EU environmental objectives, particularly the protection of biodiversity and sustainable use of resources, which are achieved by slowing down environmental degradation through information and awareness-raising policies.

Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 – a marine strategy framework directive – is the environmental pillar of the integrated maritime policy, whose objective is the establishment and implementation by EU Member States of measures designed to ensure sound environmental conditions in the marine environment up until 2020. The decree transposing this directive is awaiting approval by the Council of Ministers.

With regard to the fishing fleet, the final decommissioning and demolition of the fleet, as part of the recovery plans, will serve to reduce pressure on fisheries resources and make a positive contribution to the balance of marine ecosystems. An allied objective is to minimise the negative effects of demolishing the vessels by recycling parts of them and applying appropriate standards.

As part of the Operational Programme for the Fisheries Industry 2007-13 (PROMAR), decree No. 424-F/2008 of 13 June 2008, which approves the system of support for on-board investment and selectivity, provides *inter alia* for investment to increase energy efficiency and selectivity. As for the latter, specific projects have been planned for the purposes of:

- reducing the impact of fishing on species with no commercial value, the marine ecosystem and the seabed;
- protecting catches and fishing gear from wild predators as provided by Council Directives 79/409/EEC and 92/43/EEC; and
- replacing fishing gear with another more selective type that meets recognised environmental criteria and practice, or is designed to reduce impact on species with no commercial value.

Projects that may increase the size of the catch or the power of engines are not eligible for support. If the engines are replaced, a minimum reduction of 20% of engine power is required, except where vessels are less than 12 metres long and therefore do not use towed gear.

Following the adoption of Council Regulation (EC) No. 744/2008 of 24 July 2008, "instituting a temporary specific action aiming to promote the restructuring of the European Community fishing fleets affected by the economic crisis", Order No. 1447/2008 of 15 December 2008 was adopted. This regulation was intended not only to help operators acquire energy-efficient equipment and reduce harmful gas emissions but, more importantly, to enable them to replace engines so as to reduce installed power and improve their environmental performance.

The introduction of new production techniques and processes combined with sound environmental management practice, whether in aquaculture or in food processing, is an important aspect of investment projects, given that such projects may not receive funding if environmental legislation is not strictly observed.

Thus, under the Operational Programme for Fisheries 2007-13 (PROMAR), Order No. 424-C/2008 of 13 June 2008 on support for investment in processing, marketing and aquaculture attaches particular importance to investment intended to improve the environment. Furthermore, the environmental component is given special emphasis in all investment projects, especially when they have to do with specific measures, such as water treatment, that will minimise the environmental impact of fishing.

As part of the national plan to collect data for the Common Fisheries Policy, several points need to be examined, particularly the ecosystem-based approach to fisheries and the interactions between fisheries, aquaculture and the environment. It is necessary to assess not only the impact of fishing and aquaculture on the environment but also the constraints imposed by marine ecosystems on economic activity.

Transfer of public funds

Funding policy

The Operational Programme of Fisheries 2000-06, designated MARE – Programme for the sustainable development of the fisheries sector under the Third Community Support Framework (CSF III) for the period 2000-06 – finally ended in 2009.

The European Commission has approved the financing of the Operational Programme for the Fisheries Industry 2007-13 (PROMAR) by the European Fisheries Fund (EFF) for the period covering 1 January to 31 December 2013.

Pursuant to the SIPESCA regulation on the fisheries support regime, 24 projects to modernise local and coastal vessels have been finalised.

Social aid

In 2008, as part of the Operational Programme for the Fisheries Industry 2007-13 (PROMAR), Order No. 424-E/2008 of 13 June 2008 approved the regulations on the support regime to provide socio-economic compensation for management of the fishing fleet.

This regime is intended to grant one-off compensation at a fixed rate to fishermen whose employment contracts are terminated following the final decommissioning of the vessel on which they have worked. The compensation is provided for under PROMAR.

The compensation is in the form of non-repayable subsidies, or an individual grant at a fixed rate of 10 million euros. This amount is intended to compensate the loss of income resulting from the loss of a job for a period of 12 months. If work in fishing is resumed before the 12 months are up, a part of the amount granted is reimbursed *pro rata temporis*.

Under the same programme, suspension of Greenland halibut fishing in 2008 and 2009 was approved and regulated by Order No. 424-A/2008 of 13 June 2008. This regulation provided for the granting of financial compensation to cover the decommissioning of vessels licensed to fish Greenland halibut and to support employees concerned for a period of 30 days per calendar year.

These regulations were subsequently supplemented by measures to suspend activity, adopted in Order No. 1447/2008 of 15 December 2008 transposing Council Regulation (EC)

No. 744/2008 of 24 July 2008. The provisions of the Order also allow for the suspension of other sections of the fleet. These regulations provide for financial compensation for those employed on the vessels concerned.

Structural adjustment

Practical implementation of the measures/actions laid down in the Operational Programme for the Fisheries Industry 2007-13 (PROMAR), alongside others intended to promote further rationalisation of fisheries and marine environment management, is essential to the strategy adopted by the fisheries sector, whose ultimate objective is to guarantee the future of the sector and the well-being of the populations dependent on it.

Arrangements to support the final termination of fishing activity under the PROMAR operation have therefore been published in the following.

- Order No. 424-D/2008 of 13 June 2008, approving the regulations governing the support regime for the final decommissioning of fishing boats whose activity was already restricted in line with the plan to restore stocks of hake and langoustine. The plan to adjust fishing activity in this area provided for the withdrawal of a maximum capacity of 2 600 GT in 2008 and 2009.
- Order No. 1091/2008 of 26 September 2008, approving the regulations governing the support regime for the final decommissioning of clam dredgers in the southern zone. The plan to adjust fishing activity in this area provided for the withdrawal of a maximum capacity of 140 GT in 2008 and 2009.
- Order No. 1398/2009 of 7 December 2009, approving the regulations governing the support regime for the final decommissioning of seine netters. The plan to adjust fishing activity in this area provided for the withdrawal of a maximum capacity of 250 GT.
- Order No. 1399/2009 of 7 December 2009, approving the regulations governing the support regime for the final decommissioning of perch trawlers. The plan to adjust fishing activity in this area provided for the withdrawal of a maximum capacity of 168 GT in 2009 and 2010.

The regimes for final decommissioning were supplemented by fleet adaptation programmes (FAPs) giving practical effect to Order No. 1447/2008 of 15 December, whose object was likewise to ensure final decommissioning of fishing vessels. Portugal has implemented FAPs for the following:

- Trawlers affected by the plan to restore stocks of hake and langoustine.
- Crustacean trawlers operating under fishing agreements or in international waters in the South Atlantic, the Indian Ocean or the Pacific Ocean, if they are no longer able to use the traditional fishing zone and have no viable alternatives for their fishing activity.

Following the application of these financial compensation regimes, 25 vessels, with a total tonnage of 3 244 GT and an engine power of 10 025 kW, were withdrawn from the Portuguese fleet between 1 January 2008 and 31 December 2009.

The number of vessels withdrawn in exchange for financial compensation amounts to 76% of the total tonnage and 57% of the total engine capacity withdrawn from the fleet during those years.

It should be emphasised that some of the vessels whose final decommissioning was approved in 2009 under the regimes referred to were not withdrawn from the fleet

until 2010. Thus, in 2010 nine more vessels, with a total tonnage of 1 180 GT and total engine power of 3 334 kW, were withdrawn.

In addition to measures designed to reduce the capacity of the fleet once and for all, the Operational Programme for Fisheries (PROMAR) adopted other measures in 2008 and 2009 to help reduce fisheries operations. Orders No. 424-A/2008 of 13 June 2008 and No. 1447/2008 of 15 December 2008, as amended by Order No. 192/2009 of 20 February 2009, provided for the temporary cessation of activity by the following fleets:

Temporary 45-day orders for:

- the fleet affected by the plan to restore stocks of hake and langoustine;
- bottom trawlers;
- small pelagic seine netters;
- surface long-liners for harvesting swordfish and bottom long-liners for catching deep-water species (notably black scabbardfish and deep-water sharks);
- other multi-purpose vessels with more than 150 days' activity in 2007.

Temporary 90-day orders for:

- vessels affected by the plan to restore Greenland halibut stocks.

The temporary lay-up of the fleet affected by the plan to restore haddock and langoustine stocks was to be repeated in 2010 for a period of 35 days. The regulations governing this support regime were approved by Order No. 301/2010 of 2 June 2010.

In view of the social implications (in terms of job creation), it is worth drawing attention to Order No. 828-A/2008 of 8 August 2008 approving the regulations governing the regime to support sustainable development of fishing zones, which involved:

- making fishing zones more competitive and promoting products;
- diversifying and restructuring economic and social activity;
- promoting and taking advantage of the quality of the coastal environment and communities; and
- building capacity and cooperation.

This set of measures was intended to support sustainable development and significantly improve the lives of the communities dependent on fishing by reducing the impact of change to a minimum.

The projects relating to these measures are conducted in partnership with the CAGs – Coastal Action Groups, officially set up to fill the role and comprising local representatives from the public and private sectors.

Post catch policy and practices

Policy developments

Food safety

With reference to article 42 of Regulation (EC) No. 882/2004, the national pluriannual integrated inspection plan (PNCPI) 2009-11, drawn up by the Ministry of Agriculture, Rural Development and Fisheries and the Ministry of Economy and Innovation, covers the whole of the official national control system and goes beyond the strategic objectives for which it was intended. All those involved in the system, within the scope of their jurisdiction and

responsibilities, have the means to interact and carry out inspections in accordance with food safety legislation.

Controls on the quality of fisheries and aquaculture products are becoming more stringent in Portugal, as shown by the increase in the number of inspections.

Among the most important of the measures arising from Regulations (EC) No. 854/2004 and No. 882/2004 of 29 April are the inspections of factory/freezer vessels and industrial facilities that have been given a veterinary inspection number but have not been inspected for the past three years.

Information and labelling

In the course of the reference period, no new legislation was passed.

However, in order to ensure that demand for fisheries products does not put undue pressure on marine resources and ecosystems, market initiatives to promote sustainable fishing have been launched over the past decade. These initiatives encourage informed consumers to choose fisheries products that have been through a certification process and have been granted eco-labels.

One of the eco-labelling procedures, the world-renowned Marine Stewardship Council (MSC) certification, is based on an independent verification procedure and compliance with three key principles relating to the sustainability of the targeted resource be observed, minimum damage to the environment and effective management practices. Portugal has already fulfilled all the formalities required to gain certification of the sardine fisheries as a sustainable resource (the first of the Iberian fisheries to do so), which will be granted in 2010.

Structures

As part of the revision of the Common Organisation of the Market (COM), there have been initiatives designed to encourage greater involvement by Producer's Organisations in the marketing of products and to enable the productive sector to reap a larger part of the value generated by the production chain.

Particularly prominent in the private sector are initiatives by certain Producers' Organisations to develop direct marketing circuits, while improving the logistical operations of transport, preparation and freezing and developing production of processed products to make them eligible for accreditation. These initiatives help ensure that a greater part of the valued added goes to the producers.

Processing and handling facilities

With regard to institutional jurisdiction, mention should be made of Legislative Order No. 209/2008 of 29 October 2008, which established a New Industrial Activity Regime (REAI), abrogating Legislative Order No. 69/2003 of 26 April 2003 and associated legislation.

This new regime seeks to simplify and relax industrial licensing procedures by adapting licensing requirements to a particular type of activity and to the risks inherent in such activity. At the same time new jurisdiction or wider jurisdiction is given to other bodies, thereby increasing their involvement in the licensing process. It should be pointed out that municipalities are currently responsible for licensing establishments that process fisheries and aquaculture products. The General Directorate for Fisheries and Aquaculture is no longer responsible for licensing industrial activity.

The number of companies that process fisheries and aquaculture products rose from 187 in 2007 to 211 in 2008.

It is estimated that 9% of these companies produce preserved or semi-preserved products, 58% prepare and conserve fresh and frozen fish, 19% make dried and salted products, and 14% engage in other activities. This breakdown is much the same as in previous years. Facilities for preparing and conserving fresh and frozen fish are still most numerous, followed by those for producing dried and salted products.

In terms of the geographical distribution of companies and manpower, the North and Centre are still predominant.

Under the previous Community structural support plan and the Operational Programme for the Fisheries Industry 2007-13 (PROMAR), there was considerable support for investment in this sector both for setting up new faculties and for modernising existing ones. Under PROMAR, up until the end of 2009, EUR 25 million had been allocated to support total investment of around EUR 59 million in facilities for preparing and conserving fresh and chilled fish.

As to processing and conservation on board of fishing vessels, licences have been granted to 80 factory ships that prepare, freeze and package catches on board.

Markets and trade

Markets

Growth of domestic consumption

Portugal continues to be the EU country with the highest annual per capita fish consumption (59 kg per capita per year in live weight).

The fisheries and aquaculture products processing industry is in the process of diversifying its activity, adjusting it to market trends, which are increasingly shifting towards pre-cooked dishes, frozen cod products and, with some fluctuation, preserved foods.

Promotion

Within the framework of the PROMAR operation, Order No. 719-B/2008 of 31 July approved the regulations for the regime to support investment for the development of new markets and promotional campaigns. The projects associated with this regime are concerned with different ways of advertising and promoting fisheries and aquaculture products, quality accreditation, fact-finding missions and regional, national or crossborder trade missions, and market studies.

In this connection it is worth drawing attention to the plan to bring together industrialists in the processing sector to work on a European exhibition to advertise and promote fish products (European Seafood). This collaborative venture may soon involve representatives of the aquaculture and fishing sectors.

Trade

Volumes and value

In 2009, the Portuguese trade balance in fisheries showed a deficit of more than EUR 721 million, which was nevertheless slightly better than in 2008.

In 2008 and 2009, frozen products accounted for the bulk of imported fish products (in volume terms), 36% on average being frozen cod. It is interesting to note that from the

second half of the nineties onwards cod held an increasingly large share of frozen product imports. This development reflects changes in the "dried and salted" products sector, which is tending to use frozen cod as a raw material.

It should be noted that the only branch of Portugal's fish and fish products industry to have shown a surplus in its trade balance is the preserved fish sub-sector.

In 2008, frozen fish and preserved fish were the main exports in terms of quantity. In 2009, frozen fish was still the main export, followed by fresh and chilled fish.

In value terms, fish preserves and dried and salted products were the most important exports.

The main recipients of Portuguese fish products were Spain for fresh and frozen products, Brazil for dried and smoked products, France for preserved fish and ready meals, and the United States for preserved crustaceans and molluscs.

Policy development

Guide prices for 2010

Council Regulation (EC) No. 1212/2009 of 30 November 2009 "fixes the guide prices for fisheries products for the 2010 fishing year to determine price levels for intervention on the market". For certain species of national importance, such as sardines, whole or gutted long-finned tuna, and fresh or chilled cuttle fish, higher prices have been envisaged this year than in 2009. The price of whole hake and frozen white shrimps has also risen. The price of fresh or chilled saithe, frozen fillets of hake, swordfish, and squid has not changed. The Community producer price of tuna supplied to industry has fallen by 4% to 1 224 euros/tonne.

Autonomous tariff quotas

Cod is still the one of the top Portuguese fish imports and is mainly brought in to supply the processing industry.

By virtue of Council Regulation No. 1062/2009 of 26 October 2009, "opening and providing for the management of autonomous Community tariff quotas for certain fishery products for the period 2010 to 2012", the annual duty free quota is kept at 80 000 tonnes for chilled or frozen cod, thereby reducing the amount of salted cod for the processing industry to 5 000 tonnes.

Portugal's requests for an increase in its tuna fillets quota from 10 000 to 15 000 tonnes with a 6% customs duty and a new duty-free quota for Alaskan saithe to supply the processing industry have been successful.

Outlook

As part of its effort to exploit resources sustainably and responsibly with a view to restoring stocks and stabilising fisheries output, sectoral policy will pursue the following broad objectives:

- to help make the fisheries sector more competitive while adapting it to available resources;
- to expand scientific research into fisheries resources taking an ecosystem-based approach, promoting innovative methods and technologies and opening up other fields of application;
- to promote expansion, innovation and diversification in aquaculture;

- to help upgrade fisheries and aquaculture products through further innovation, improved quality and greater diversification of processed foods;
- to increase the role of producers' organisations by encouraging them to make a greater contribution to market planning, innovation, concentration of supply, and labelling and certification procedures;
- to develop coastal regions dependent on fisheries and promote social and economic cohesion of fishing communities, particularly through coastal action groups;
- to improve control and surveillance of fishing in accordance with the new Community control scheme provided for by Council Regulation (EC) No. 1224/2009 of 20 November 2009.

OECD Review of Fisheries 2011
Policies and Summary Statistics
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PART III

Chapter 24

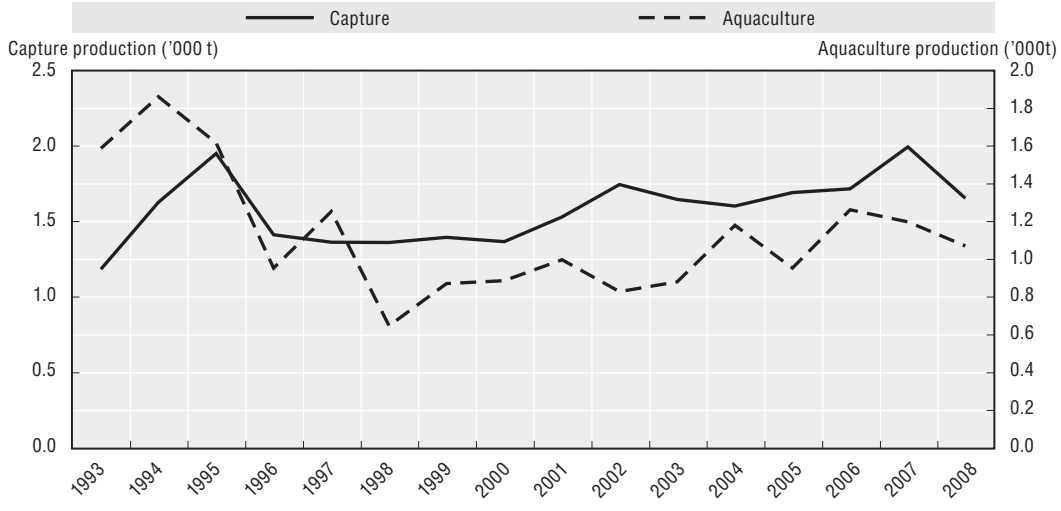
Slovak Republic

Slovak Republic

Summary of recent developments

- The Slovak Republic is a landlocked country which is not active in fisheries. The Slovak Republic produces fish in aquaculture sites which produce mainly carp and trout.
- The Slovak Republic has around 66 fishers who are mainly small scale producers. The Slovak Republic has about ten fish farms with production over 100 tonnes per year.
- The trade balance in fish products has been showing a deficit since 1997.
- There were no new policy changes in the aquaculture sector, but the Food Codex governing fishery products was revised in May 2009.

Harvesting and aquaculture production (tonnes)

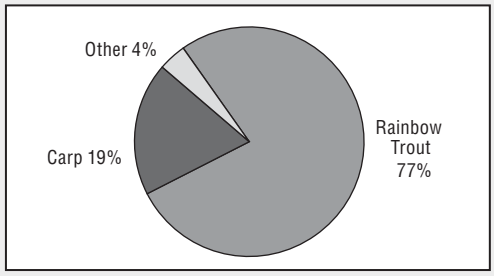


Source: FAO FishStat Database.

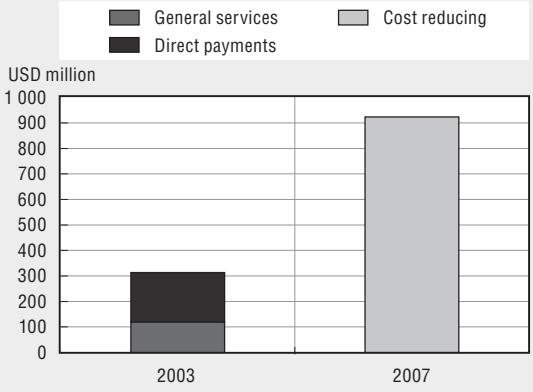
Key characteristics of the sector

- Since the Slovak Republic does not have any commercial capture fisheries, the diagram shows key species in aquaculture in terms of value. By value, the most important species in 2008 were rainbow trout (77%), followed by carp (19%).
- The Slovak Republic provided a total of USD 923 500 of government financial transfers to the aquaculture sector in 2007. Direct payments made up 100% of GFTs in 2007. By comparison, in 2003 there were no direct payments.
- Both imports and exports in fish and fish products have been increasing since 2000. However, trade in fish and fish products has shown a deficit since 1997. The trade deficit has been increasing in recent years.
- There were 880 people employed in the aquaculture sector in 2008. However, the number of fish farmers in the Slovak Republic varies from year to year because the number of part-time workers fluctuates. The number of full-time workers has been relatively stable, ranging from 237 to 259 over the last five years.

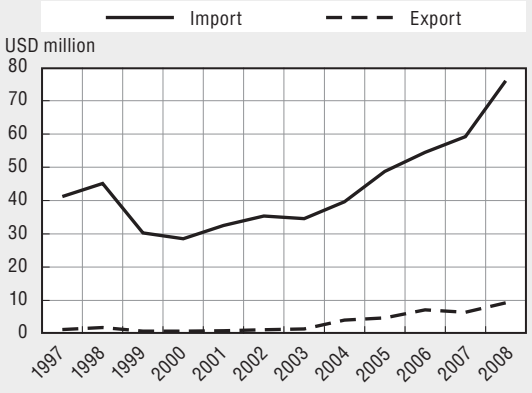
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	n.a.	n.a.	n.a.
Number of fish farmers	1 040	880	–15.4
Total number of vessels	n.a.	n.a.	n.a.
Total tonnage of fleets	n.a.	n.a.	n.a.

Legal and institutional framework

A revision of Food Codex of the Slovak Republic governing fishery products was published on 22 May 2009.

In the Ministerial Decree of the Ministry of Agriculture and Ministry of Health issued on 25 August 2008 under No. 1903/2008-100, chapters are implemented which regulate fisheries. Articles were amended on the labelling provisions in the fishery sector, and definitions and requirements for effort, handling and transportation of live fish and their marketing were also put in place.

Recreational fisheries

In 2008, 99 843 anglers fished 1 656 tonnes compared to 110 683 anglers and 1 761 tonnes in 2009.

Aquaculture

The Slovak Republic produces fish in aquaculture sites mainly focussing on carp and trout. Presently the Slovak Republic has around 66 fish farmers which are mainly small scale producers. The Slovak Republic does have around ten fish farms with a production of over 100 tonnes per year. No new policy initiatives were taken for the aquaculture sector.

The production of carp was 1 597.2 tonnes in 2006, 1 429.5 tonnes in 2007 and 1 429.9 tonnes in 2008, whereas the production of trout was 836.9 tonnes in 2006, 938.8 tonnes in 2007, and 832.4 tonnes in 2008. The production of all species in aquaculture amounted to 2 979 tonnes in 2006, 2 871.3 tonnes in 2007, and 2 733.7 tonnes in 2008. These values included catches from recreational fisheries.

In 2008, 880 people were employed in the aquaculture sector, a decrease compared to 1 097 people in 2007. However, the number of fish farmers in the Slovak Republic varies from year to year because the number of part-time workers fluctuates from year to year. The number of full-time workers has been relatively stable, ranging from 237 to 259 over the last five years.

Government financial transfers

The Slovak Republic provided a total of USD 923 5 thousand of government financial transfers (GFTs) to the aquaculture sector in 2007. Direct payments contributed 100% of GFTs in 2007, though there were no direct payments in 2003.

Markets and trade

Markets

Domestic consumption of fish meat is almost unchanged compared to past years with only minor changes taking place. Per capita consumption was 5.1 kg per capita in 2006, in 2007 it was 4.7 kg and in 2008 it was 4.8 kg per capita. This information is published in the official page of Statistical Office of the Slovak Republic.

Trade

Export value of fish and fish products was EUR 5.74 million in 2007, EUR 6.94 million in 2008 and EUR 5.12 million in 2009. Import value of fish and fishery products was EUR 48.13 million in 2007, EUR 51.9 million in 2008 and EUR 49.39 million in 2009.

PART III

Chapter 25

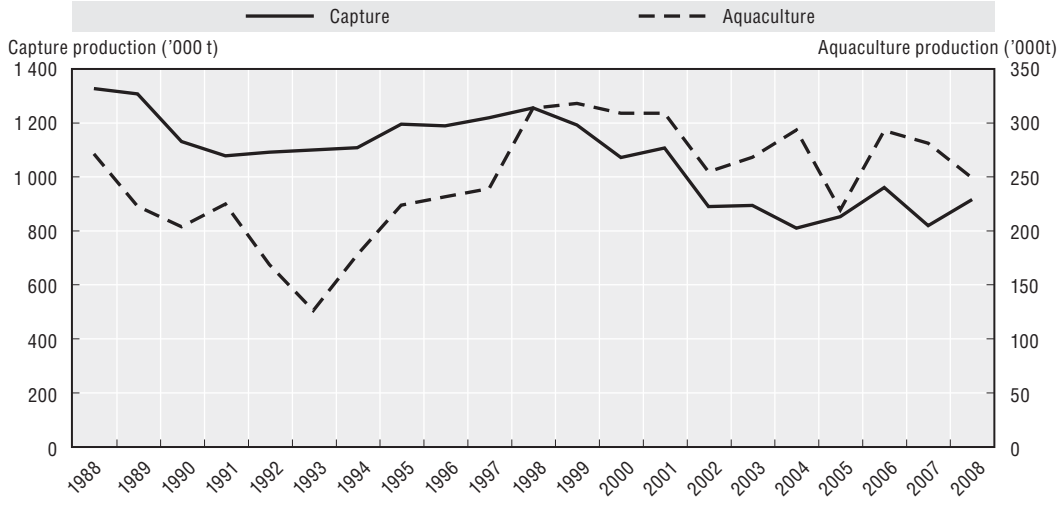
Spain

Spain

Summary of recent developments

- In April 2008, the Ministry of Agriculture, Fisheries and Food and the Ministry of the Environment was restructured into a new Ministry of the Environment, and the Rural and Marine Affairs. The General Secretariat for the Sea, which reports to the new Ministry, is the central government administration in charge of marine fisheries.
- A new Royal Decree No. 747/2008, of 9 May 2008, laying down regulations for the system of sanctions applying to sea fishing on the high seas established a coherent framework adapted to the salient features of marine fishing, while at the same time improving administrative procedures.
- All Spanish fishing vessels over 15 metres in overall length, together with all those operating in international waters or in the waters of third countries, must carry on-board satellite monitoring systems.
- Since 31 December 2007, the number of vessels has fallen by 1 890 units, or 29 043 GT. In 2008 and 2009, support for the permanent withdrawal of fishing vessels benefited 164 vessels.
- Marine Natura Network is being implemented by the Ministry. It started with the approval of measures aimed at protecting the marine area *El Cachucho* in 2008 as a first step in the process to declare it a Marine Protected Area (MPA).

Harvesting and aquaculture production (tonnes)

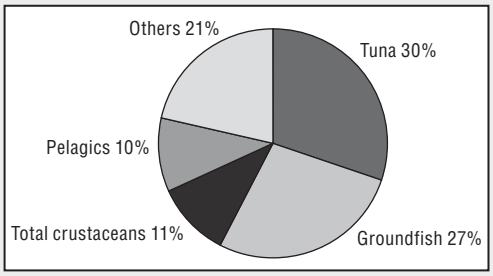


Source: FAO FishStat Database.

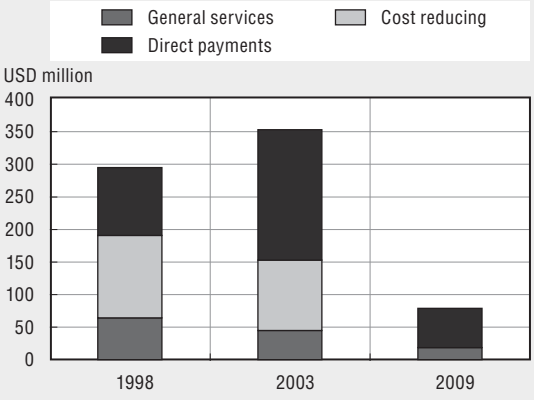
Key characteristics of the sector

- The most important species landed in 2008 in terms of value were tuna (30%), followed by groundfish (27%), crustaceans (11%) and pelagics (10%).
- In 2009, the government financial transfers to the marine capture fisheries sector was USD 79 million, which is a substantial decline compared to USD 353 million in 2003. It consists of direct payments (USD 60.61 million) and general services (USD 19.35 million). In terms of funding sources, EU funds account for more (56.2%) than national funds (43.8%).
- Both imports and exports of fish products in Spain have been increasing continuously. Imports in 2008 reached USD 7 259 million, which is a 111.4% increase since 2000 and makes Spain the third largest fish-importing country among OECD countries.
- The number of fishers and fish farmers has been decreasing over the years. The number of vessels and tonnage of the fleet shows a similar trend.

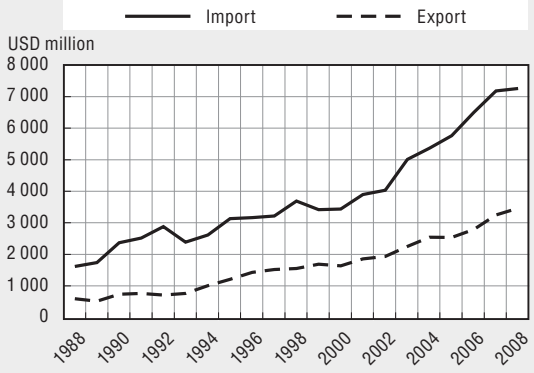
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	46 189	30 958	–33.0
Number of fish farmers	9 115	7 376	–19.1
Total number of vessels	16 660	11 394	–31.6
Total tonnage of fleets	526 134	458 180	–12.9

Legal and institutional framework

EU jurisdiction

As Spain is a member of the European Union, the management and conservation of sea fishery resources are subject to EU regulations. Domestic policy in these fields therefore complies with the requirements of the Common Fisheries Policy (CFP), which was reformed in 2002 under Regulation (EC) No. 2371/2002.

Spanish jurisdiction

With regard to the assignment of domestic responsibilities, the Spanish Constitution defines the respective jurisdictions of central government and the Autonomous Communities. The central government has sole jurisdiction over sea fishing "subject to the powers that may be delegated to the Autonomous Communities regarding the management of the fisheries sector". Autonomous Communities have sole jurisdiction over "fishing in *internal* waters, the harvesting of shellfish, and aquaculture". Fishing in internal waters is thus the responsibility of the ten coastal Autonomous Communities. The central government has full jurisdiction in matters relating to sea fishing, and hence the relevant legislation and its implementation. With regard to the development of the fishing industry and commercial activity, however, the central government only establishes "basic legislation", *i.e.* the fundamental principles governing such activities; the regulatory framework in these areas is established by Act 3/2001, of 26 March 2001, on territorial sea fisheries. The Autonomous Communities can adopt provisions that complement legislation in these two areas and proceed to implement them.

In April 2008, the Ministry of Agriculture, Fisheries and Food and the Ministry of the Environment were restructured into a new Ministry of the Environment and the Rural and Marine Environment.

The General Secretariat for the Sea, which reports to the new Ministry, is the central government administration responsible for marine fisheries. Responsibility for fisheries and oceanography research lies with the Spanish Institute of Oceanography (IEO), which reports to the Ministry of Science and Innovation.

Royal Decree No. 747/2008 of 9 May 2008 laying down regulations with respect to the sanctions system applying to sea fishing on the high seas establishes a coherent framework adapted to the particular features of sea fishing, while at the same time improving administrative procedures. Its aims include the development of the procedure provided for in Royal Decree 1134/2002 on the application of sanctions relating to sea fishing by Spanish nationals on board vessels flying flags of convenience, and the adaptation of the system of sanctions to ensure maximum efficiency in the event of illegal, unregulated and unreported (IUU) fishing, as defined by FAO.

Order ARM/2077/2010 of 27 July 2010, laying down regulations on access control of third countries' vessels, transit operations, trans-shipments, imports and exports of fishing products to avoid and eliminate IUU fishing, was approved in 2010.

Four other regulations are under approval process: a law on sustainable fishing; a law of Protection of Marine Environment; a Royal Decree to regulate recreational fishing in territorial waters, regulated by central government; and a Royal Decree to adapt Royal Decree 176/2003 to new Community control rules, on control and inspection functions.

Capture fisheries

Manpower, structure and development of the fleet

As of 31 December 2009, the Spanish sea fishing fleet comprised 10 198 motorised vessels, 69% of which were under 12 metres in overall length, and 918 small non-motorised vessels, with an overall tonnage of 61 745 GT. Since 31 December 2007, the number of vessels has fallen by 1 890 units, or 29 043 GT.

Management of commercial fisheries

For management purposes, Spanish sea fishing is divided into four distinct groups, depending on the zone of activity, *i.e.* fishing in territorial waters, fishing in Community waters, fishing in third country waters, and fishing in international waters whether regulated by multilateral organisations or not.

Territorial waters are divided into four main areas regarding fisheries management purposes. The main initiatives launched over the period 2008-09 were as follows.

For the Mediterranean Sea, the Comprehensive Management Plan for the Conservation of Fishery Resources in the Mediterranean adopted in January 2006 was extended until the end of 2009 by Ministry Order APA 254/2008, of 31 January 2008. It aims at implementing certain measures for sustainable fisheries such as reducing the fishing effort by 10% for certain fleet segments in the period of reference.

In the Gulf of Cadiz, plans for the conservation and sustainable management of trawler and purse-seine fisheries were adopted in 2009. They focus mainly on reduced fishing effort and biological rest periods (*i.e.* seasonal closures).

In the Cantabrian and Northwest Area, the ten-year Hake and Norway Lobster Recovery Plan drawn up in 2005 by the European Union is based on annual 10% reductions in fishing effort for hake in addition to special control measures. As for Norway lobster, there is a closed area to the west of Las Rías Bajas (south-west Galicia).

For the Canary Fisheries Area, there have been no changes in current fishing regulations.

In Community waters, fishing activities have proceeded in strict compliance with the European Union's CFP standards.

All Spanish vessels operating in international waters must without exception obtain a temporary licence from the General Secretariat for the Sea authorising them to carry on with their activity. When a vessel has obtained a licence to fish in a zone regulated by a regional fisheries organisation (RFO), it must observe the resource management/conservation measures and the monitoring/inspection measures stipulated by that RFO. In some cases, licensing is subject to the observance of additional more restrictive measures, imposed by the EU or the Spanish authorities.

The object of these measures is to adapt the fleet to available resources and to ensure responsible fishing.

The presence on board of international observers is mandatory as required by RFOs such as NAFO, CCAMLR, IATTC, SEAFO, SPFRMO and ICCAT. Furthermore the Spanish authorities require fleets operating in certain international zones to carry scientific observers on board; these arrangements are planned and controlled by the Spanish Institute of Oceanography (IEO) and the aim is to monitor fisheries, assess stock status and obtain other biological and environmental data.

The IEO also conducts experimental fishing schemes with a view to enhancing fishing-gear selectivity.

Management of recreational fisheries

Recreational fisheries within territorial waters under the control of central government are regulated by *Ministry Order of 16 February 1999,* under the State Fishery Act 3/2001, while Autonomous Communities regulate these activities within inland waters. A licence issued by the regional authorities is needed to fish. A specific authorisation issued by central authorities under the mentioned rule is required for fishing certain species called "Annex III species", *e.g.* hake or tuna species. As of October 2010, 5 910 authorisations had been issued.

Due to the increase of such activity, it is foreseen that a Royal Decree will be published to regulate and harmonise recreational fisheries with existing rules, and to create a national registery of recreational fishing vessels.

Research

Researchers from the IEO fisheries department have been regular participants in different international working groups that assess the stock status of species of great value to our fleets, as hake, angler fish, megrim, sardine, mackerel, horse mackerel, cod, Greenland halibut, cephalopods, crustaceans and tuna and tuna like species.

In addition, IEO monitors the experimental fisheries pilot schemes proposed by the General Secretariat for the Sea. There have also been studies on the impact of fisheries on the ecosystem, via incidental catches of turtles, cetaceans and sea birds, and on the impact of reserves, marine protected areas and artificial reefs.

Over the 2008-09 period, scientific research was conducted on research and commercial vessels and oceanographic programmes on Spanish and foreign research vessels. Oceanographic researchers also participated as observers in several scientific international research programmes.

Table 25.1. **Main areas and stocks fished by Spain in 2007-09**

Area	Stocks
EU Atlantic Waters[1]	Hake, anglerfish, megrim, norway lobster, poutassou, anchovy, sardine, mackerel and Atlantic horse mackerel
Mediterranean Sea	Hake, mullet, prawn and anchovy
Waters of North-west Africa and the Canary Islands	cephalopods, hake, prawn, sardine and *Sparidæ*
Atlantic Ocean, Mediterranean Sea and Indian Ocean, Pacific Ocean	Bluefin tuna, albacore, bigeye tuna, skipjack, tuna like species and swordfish
North Atlantic and Arctic Ocean	Cod, redfish, deepwater prawn
South East Atlantic	Deepwater and demersal species
South West Indian Ocean	Crustaceans on the continental slope
South West Atlantic Ocean	Cephalopods and hake
North West Atlantic Ocean	Cod, Greenland halibut, American plaice, yellowtail flounder, redfish, deepwater prawn, plaice

1. From western Scotland to the Straits of Gibraltar.

Monitoring and enforcement

The Sea Fisheries Act (Act 3/2001, of 26 March 2001) regulates the monitoring and inspection of fishing on the high seas, a central government responsibility, via inspection and monitoring work by fisheries inspectors at sea and on land. Royal Decree 176/2003, of 14 February 2003, regulates the duties of these inspectors.

In 2008-09, the co-operation agreements between the Fisheries authorities, the Spanish Navy and the *Guardia Civil* continued. The purpose of these agreements is to increase the effectiveness and number of naval inspection units in the various national and international fishing grounds worked by the Spanish fishing fleet.

The Fisheries Inspection Services reporting to the Autonomous Communities worked with the central government in such areas as port inspections, monitoring and surveillance of fisheries activities, action against illegal fishing, and the marketing of fish subject to minimum size requirements.

Table 25.2. **The number of inspections and offences in 2008 and 2009**

Resources	2008		2009	
	Inspections	Offences	Inspections	Offences
Land	2 531	553	3 270	493
Sea	2 122	581	2 063	553
Air	5 320[1]	91	8 075[1]	71
Total	**9 973**	**1 225**	**13 408**	**1 117**

1. Air surveillance of fishing vessels.

The leading initiatives in terms of monitoring, inspection and surveillance conducted over the past two years included campaigns focusing on albacore tuna, Mediterranean bluefin tuna, inspection campaigns in NAFO and NEAFC waters, and the ICCAT Port Inspection Scheme.

In 2009, in accordance with EU regulations whereby each Member State must set up a satellite monitoring system for fishing vessels over 15 metres in overall length, Spain's Fisheries Monitoring Centre handled 10 980 087 reports from 2 427 Spanish and 479 foreign vessels (compared with 8 749 341 similar reports in 2007 from 2 540 Spanish and 436 foreign vessels).

Inspection of compliance with regulated minimum sizes and labelling for fish transported by road (PACIAP) is implemented in collaboration with the Directorate General of Police and Civil Guard and the Autonomous Communities under the Framework Agreement (1997). The objective is to reduce or prevent illegal trade in fishery products and has been in place for 13 years. In addition to the action at sea in 2008 and 2009, there were 673 and 667 control missions, respectively, on road transport of fish.

Aquaculture

Marine aquaculture production in 2009 reached 268 455 tonnes. The most important species were mussel (198 531 tonnes), sea bream (23 218 tonnes), sea bass (12 657 tonnes) and turbot (7 253 tonnes). Inland water aquaculture production reached 21 016 tonnes, of which rainbow trout production was 20 809 tonnes.

At the national level, the Advisory Committee on Marine Aquaculture organised a forum in October 2009 on **National Plans**, with the aim to transfer the latest results and knowledge. A National Plan is an action/project planning framework to promote and develop the aquaculture sector in Spain and is planned in conjunction with regional communities. Project issues include those with particular importance for the industry such as environment, health, culture systems, and diversification.

Under a co-operation agreement to produce a series of "Guides for the Sustainable Development of Mediterranean Aquaculture", signed in 2006 by the General Secretariat for the Sea and the IUCN Centre for Mediterranean Cooperation, three have been published to date:

- interactions between aquaculture and the environment;
- site selection and site management;
- responsible practices and certification.

Two more guides are being developed with regard to freshwater aquaculture and diversification in aquaculture.

Another action in development is the International Action Plan for Spanish Aquaculture 2010-11, *i.e.* a series of actions carried out with the aim of promoting the internationalisation of Spanish aquaculture enterprises. This takes place through the development of specific actions to promote sustainable aquaculture development, to enhance co-operation and, ultimately, enhance the development of the sector through corporate and institutional co-operation.

In 2008, the Spanish Aquaculture Observatory Foundation (FOESA) was created increase the synergy between enterprise and research. The new management structure helps to speed up decision-making on economic, administrative and technical issues.

Fisheries and the environment

Exogenous environmental threats to aquatic ecosystems

IEO researchers monitor marine contamination on an on-going basis via a network of locations throughout Spanish waters; it also studies red tides to check the safety of sea fishery products.

Environmental policy changes

Marine reserves of value to fishing

During 2008-09, the Ministry for Environment and Marine and Rural Affairs continued to manage the ten Marine Reserves in territorial waters regulated by the central government. Five are managed entirely by the central government: Masía Blanca (Catalonia), the Columbretes Islands (Valencia), Cabo de Gata-Níjar (Andalusia), the Island of Alborán (Andalusia) and the Island of Palma (Canary Islands), while the management of the other five is shared with regional governments: the Island of Tabarca (Valencia), Cabo de Palos-Hormigas Islands (Murcia), the Island of Graciosa (Canary Islands), Punta de la Restinga-Mar de las Calmas (Canary Islands) and Cala Ratjada-Llevant de Mallorca (Balearic Islands).

Annual expenditure for these ten reserves is approximately EUR 6 million per year, most of which goes to surveillance but also to monitoring studies, infrastructure and awareness campaigns.

Marine protected areas

Spain is leading a major project focused on marine deep habitats and species in marine Spanish open – not coastal – waters called INDEMARES. It is funded by the EU Commission and ten zones are being examined: five in the Atlantic and five in the Mediterranean. The results will lead to the creation of at least ten MPAs.

Spain participates in the international expressions of interest to foster MPAs between neighbouring countries as well as in Areas Beyond National Jurisdiction (ABNJ) for coastal MPAs.

In 2009, two OSPAR protected areas were in place: "El Cachucho" and "Parque Nacional de las Islas Atlánticas".

Government financial transfers

Transfer policies

During 2008 and 2009, Regulations (EC) No. 2372/2002 *Specific measures forPrestige case* and Regulations (EC) No. 2561/2001 and (EC) No. 2325/2003 *Specific measures for Morocco* came to an end.

For the period 2007-13, support for the fisheries sector in the European Union is funded via the new European Fisheries Fund (EFF), under Regulations (EC) No. 1198/2006 and 744/2008; the latter lays down a specific temporal action to promote the fishing fleet adaptation due to the high increase in fuel prices.

Support for production and factors of production

The government financial transfers to the fisheries sector in 2009 was EUR 155 616 600 in total. It consists of marine capture fisheries (EUR 56 849 000), aquaculture (EUR 20 213 000), and marketing and processing (EUR 78 554 600). In marine capture fisheries sector, direct payments accounts for 76.8% (EUR 43 637 000) of the government transfers to, whereas general services accounts for 23.2% (EUR 13 212 000). In terms of funding, EU funds account for more (55.5%, EUR 86 442 700) than national funds (45.5%, EUR 69 173 900), which is the same trend in all three sectors.

Structural adjustment

In 2008 and 2009, support for permanent withdrawal via previous Financial Instrument for Fisheries Guidance (FIFG) was awarded to a total of 43 fishing vessels, reducing the overall tonnage of the fleet by 1 408.52 GT. Via the new European Fisheries Fund (EFF), the support for permanent withdrawal was awarded to a total of 121 fishing vessels, reducing the overall tonnage of the fleet by 8 097.19 GT.

Post-harvesting policies and practices

Policy changes

In accordance with the basic market regulations (Reg. [EC] No. 104/2000), producer organisations presented 32 and 28 new operational programmes during the 2008 and 2009 campaigns, respectively, to promote rational and sustainable resource use and market-oriented production to optimise catches. A Royal Decree (RD 1822/2009) was issued, which cancel previous regulations, Royal Decree (RD 607/2006) and 2064-04. The new Royal Decree regulates the first sale of fishing products. It applies only to fishing products obtained in fishing operations, live, refrigerated, and frozen, except aquaculture products and seafood products.

Food safety

The General Secretariat for the Sea provides technical assistance on food safety to countries exporting fish to the European Union, notably developing countries in Africa and

Latin America, to improve inspection and monitoring of fish at source, in accordance with EU requirements on food safety and traceability. The initiatives developed in 2008 and 2009 benefited Cape Verde, Ecuador, El Salvador, Guinea Bissau, Guatemala, Mauritania, México, Mozambique, Morocco, Panamá, Peru, Poland, Russia, Turkey and Uruguay.

Information and labelling

The General Secretariat for Sea Fisheries issued the following publications in 2008-09:

- Standard UNE 195001:2009. *Best Hygienic Practices Guidelines for Primary Production at Sea. Short (Less than 48 Hours Fishing Trips)*.
- Standard UNE 195002:2009. *Fishing. Traceability Guidelines for Primary Fish Production, from Catch to Expedition after First Sale*.
- Standard UNE 173201:2010 Marine Aquaculture. *Best Hygienic Practices Guidelines* for Aquaculture primary production.

Markets and trade

Markets

Trends in domestic consumption

The total amount of fish consumed by Spanish households in 2009 was 1 261 720 tonnes, a 0.89% increase from the previous year, representing 4.37% of total amount of food household consumption. Spending amounted to EUR 191.65 per person per year, a decrease of 4.4% from the previous year. Consumption per person was 27.57 kg, a decrease of 0.8%.

A study in 2009 on the socio-economic profile of household consumption of fishery products shows that purchases by families with children are lower than those composed of adults only. Another conclusion is that mid-level income families represent 50% of those households that consume fish products, and high level income families represent 20%.

In relation to employment, the study shows that the level of consumption of fishery products by unemployed people is higher than that of the active population.

Supermarkets have gained ground over larger and smaller stores in terms of the purchase of fresh fishery products (40%), convenience being cited as the main reason (61% of those surveyed).

Promotional efforts

The Fund for the Regulation and Organisation of the Market in Fish and Marine Culture Products (FROM) maintained the same promotional programme policy of previous years. This consisted of generic campaigns to promote the responsible consumption of fishery products, consumer information via labelling, and encouraging young children to eat fishery products. There were also specific campaigns that focussed on traditionally caught albacore tuna, marine aquaculture, farmed trout, mussels, canned fish, frozen fishery products and bluefish. It should also be noted that FROM participates at both domestic and international fishery exhibitions and fairs.

Outlook

Following the recent ministerial restructuring, which has seen the emergence of a new Ministry of the Environment and the Rural and Marine Environment, Spain will pursue the

consolidation of fisheries as a responsible economic activity and consistent with a marine ecosystem-based approach.

Spain will therefore continue its initiatives to reinforce measures against illegal, undeclared and unregulated fishing.

Spain is struggling to implement Natura 2000 Marine Network, while maintaining support to national marine reserves, the Barcelona Convention areas (ASPIM) and OSPAR areas, and being aware of the need to foster the protection of large deep zones and ABNJ. The Spanish Law on the Protection for the Sea will see the implementation of a network of MPAs.

PART III

Chapter 26

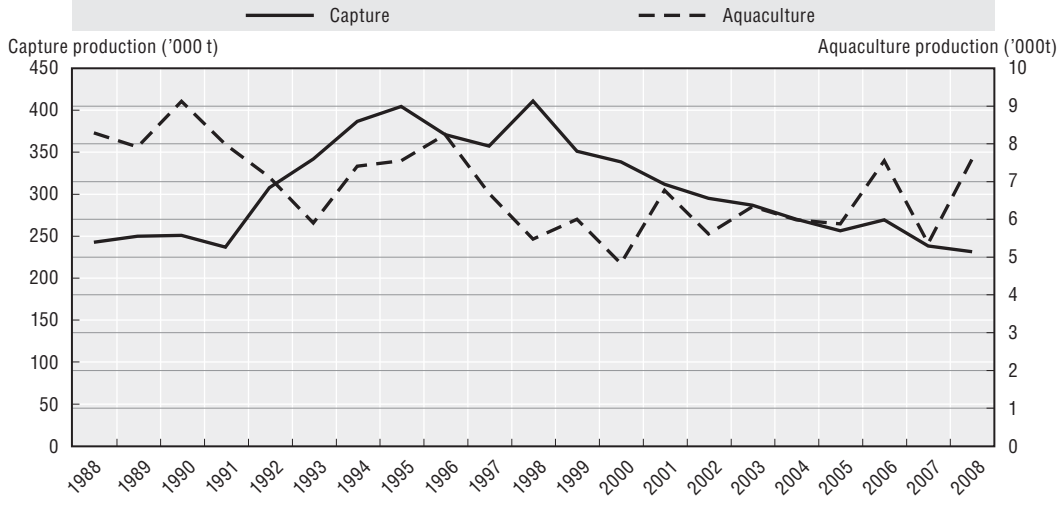
Sweden

Sweden

Summary of recent developments

- In 2009, Swedish fishing vessels landed 197 000 tonnes of marine species valued at SEK 889 million (EUR 84 million). Swedish aquaculture production is quite volatile; in 2009, production (for human consumption and for restocking purposes) amounted to 10 343 tonnes valued at SEK 280 million (EUR 26.3 million).
- In 2008-09, measures were implemented to reduce fleet overcapacity. Two decommissioning schemes were initiated, both focusing on bottom trawlers targeting cod but in two different areas: *i)* the Baltic Sea; and *ii)* the North Sea, the Skagerrak and Kattegat.
- EU fish stocks management and recovery plans are being implemented. It is likely that these efforts will yield positive results and contribute to improved profitability for the fleet. However, the development of price at first sale, the level of the fuel costs, and the evolution of interest rates are likely to continue to be other important factors for profitability.
- There are preparations to re-organise the fisheries administration with the aim to integrate fisheries management issues in a new Swedish agency for marine and freshwater environmental issues in 2011. The new agency will have a broad mandate to work with issues linked to the management of the waters, fisheries, environmental issues and marine spatial planning.

Harvesting and aquaculture production (tonnes)

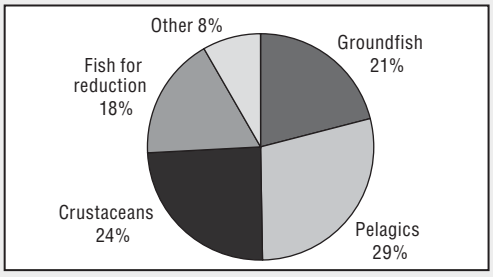


Source: FAO FishStat Database.

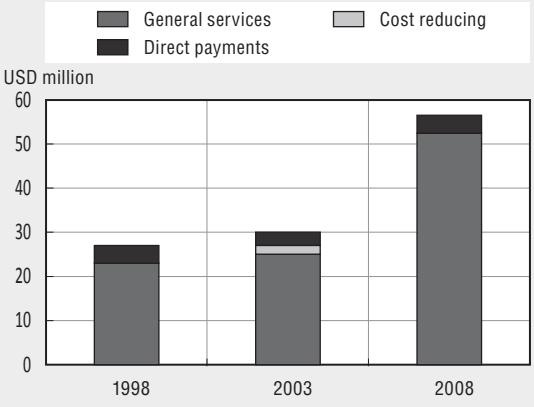
Key characteristics of the sector

- In 2009, Swedish fishing vessels landed 197 000 tonnes of marine species valued at SEK 889 million (EUR 84 million). Landings abroad, mainly in Denmark, were dominant, representing 60% of total landings in volume. In particular, herring and sprat for reduction purposes, in addition to herring and mackerel for human consumption, were landed abroad.
- Total GFT in Sweden amounted to SEK 638.5 million in 2008, roughly corresponding to the value of landings by Swedish vessels in Sweden. This includes SKR 399.4 million for general services and SEK 185.6 million for fuel tax exemptions.
- Swedish foreign trade has increased sharply in the last decade. Since the year 2000, exports have increased by 367% and imports by 301%. Sweden's imports of fishery products come mainly from Norway and Denmark. Much of the salmon imported from Norway is re-exported to the rest of Europe.
- Employment in the fisheries sector as a whole is decreasing. Total employment in all sectors was approximately 4 100 persons in 2008. Professional personal fishing licenses for inland or marine fisheries were held by 1 800 persons; 379 were employed in aquaculture, and 1 934 were employed in fish processing.

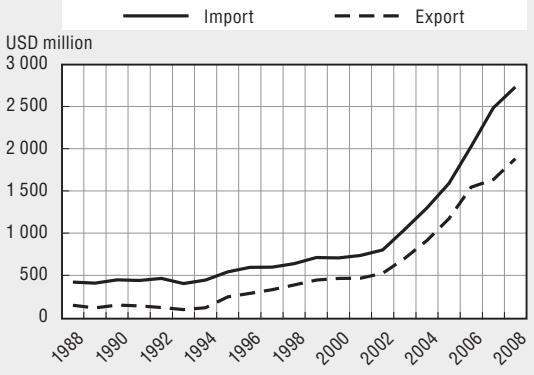
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	2 308	1 800	–21.6
Number of fish farmers	558	379	–32.0
Total number of vessels	1 963	1 466	–25.3
Total tonnage of fleets	49 914	41 595	–16.6

Legal and institutional framework

Sweden's fisheries sector is managed within the framework of the EU Common Fisheries Policy (CFP). The general principles governing national policy are established by a Parliament Act which authorises the Government to supplement the EU legislation and to regulate fishing outside the scope of the CFP. The government has delegated part of this authorisation to the Swedish Board of Fisheries (SBF) together with some principles and guidelines.

The central administration of fisheries policy is divided between the Ministry of Agriculture and the Swedish Board of Fisheries (SBF). The ministry draws up the framework of the fishery policy and represents Sweden at international negotiations. SBF is the executive branch of the administration and is responsible for implementation.

Capture fisheries

In 2009, Swedish fishing vessels landed 197 000 tonnes of marine species valued at SEK 889 million (EUR 84 million). Landings abroad, mainly in Denmark, were dominant, representing 60% of the total landings in volume. In particular, herring and sprat for reduction in addition to herring and mackerel for human consumption were landed abroad. Even though landings abroad are larger by volume, domestic landings represent 70% of total value, mostly due to high value species like cod, Norway lobster, and northern prawn (*Pandalus borealis*). Volume and landings in 2005-09 are shown in Table 26.1.

Table 26.1. **Landings by Swedish fishing vessels, 2005-09**

	Landings in Sweden			Landings abroad			Total landings		
	'000 tonnes	SEK million	EUR million	'000 tonnes	SEK million	EUR million	'000 tonnes	SEK million	EUR million
2005	121	608	66	127	269	29	248	877	95
2006	110	683	74	152	330	36	262	1 013	109
2007	115	705	76	131	379	41	246	1 084	117
2008	90	642	67	129	327	34	219	968	101
2009	77	621	59	120	268	25	197	889	84

Source: Statistics Sweden.

Landing volumes decreased over the last decade while values fluctuated due to price volatility and changing species composition in the same period. Table 26.2 illustrates key species.

Table 26.2. **Key species landed by volume and value in 2009**

	Volume	Value	
	'000 tonnes	SEK million	EUR million
Herring	37 527	161	17.0
Sprat	16 517	34	3.2
Mackerel	3 374	36	3.4
Cod	11 282	155	14.6
Northern prawn	2 303	128	12.0
Norway lobster	1 268	106	10.0
Fish for reduction	121 254	170	16.0
Other	3 878	99	9.3
Total	**197 403**	**889**	**84.0**

Source: Statistics Sweden.

Fishing fleet

The capacity and trend of the Swedish fishing fleet is given in Table 26.3.

Table 26.3. **Fishing fleet capacity**

	Vessels		Tonnage		Engine power	
	Number	Change from previous year (%)	GT	Change from previous year (%)	kW	Change from previous year (%)
2005	1 589	–1	44 105	–1	216 965	–3
2006	1 551	–2	43 768	–1	215 774	–1
2007	1 504	–3	42 929	–2	210 877	–2
2008	1 466	–3	41 595	–3	207 065	–2
2009	1 409	–4	37 670	–9	192 982	–7

Source: Swedish Board of Fisheries.

In numbers more than 80% of the vessels are less than 12 metres, but in terms of total tonnage close to 60% can be attributed to vessels of 24 metres and over. The fleet structure as of 2009 is presented in Table 26.4.

Table 26.4. **Fleet structure by length, 2009**

	Number	Share (%)	Tonnage (GT)	Share (%)
0-11.9 m	1 162	82.0	5 334	14
12-23.9 m	180	13.0	10 166	27
24-39.9 m	64	45.0	19 804	53
40 m and over	3	0.2	2 366	6
Total fleet	**1 409**	**100.0**	**37 670**	**100**

Source: Swedish Board of Fisheries.

Profitability

The total volume and value of landings decreased in 2008 compared to 2007, but the landed value per vessel increased, with the exception for some cod trawlers. The same pattern is displayed in gross value added* per vessel. Total income (value of landings, direct subsidies, and other income combined) and profit of the national fleet increased. Table 26.5 summarises the economic performance of the fleet.

Large pelagic vessels accounted for over 40% of the total national landing value and 80% of landed volume in 2008. This segment experienced losses in 2004-06, but has improved its profitability despite increasing fuel prices, showing positive signs with regard to profits in 2007 and 2008. One explanation for this is a new management system introduced in 2007 for the pelagic segment, based on individual vessel quotas giving vessel owners increased possibilities to manage and plan their fishing during the year. Pelagic species prices have also had a positive trend, although the price of sprat decreased in 2008 compared to a peak in 2007.

* Gross Value Added (GVA) measures the contribution the fishing sector makes to the economy, *i.e.* is the value of the production less intermediate consumption.

Table 26.5. **Economic performance of the Swedish national fleet, 2006-08**

	2006		2007		2008	
	EUR million	Share of total income (%)	EUR million	Share of total income (%)	EUR million	Share of total income (%)
Total income[1]	**142**		**142**		**149**	
Profit/loss	7	5	9	6	18	12
Gross value added[2]	74	52	66	47	81	54

1. Includes value of landings, direct subsidies and other income.
2. Contribution to gross national product.

Source: Swedish Board of Fisheries.

Vessels targeting cod have been affected by the decrease in cod quotas in recent years in the Baltic Sea and the North Sea. There is overcapacity in the cod segments, but two decommissioning schemes were initiated in 2008-09 to reduce capacity.

The profitability in the segment targeting northern prawn (*Pandalus borealis*) is not satisfactory. The segment is coping due to low capital costs (vessels old and paid). Vessels targeting Norway lobster were struggling economically in 2004, but have since improved due to better landing prices and volumes.

The profitability of fresh water fisheries in lakes and rivers has improved in the last few years.

The total fuel consumption for the fleet decreased from over 70 million litres in 2004 to approximately 40 million litres in 2008, which is likely a result of vessels changing their fishing behaviour due to the fuel price changes. Fuel prices increased dramatically in 2005 and 2006, displayed a slight decrease in 2007 but increased dramatically in 2008. The lower fuel consumption has however not been able to compensate for the rises in fuel prices. The total costs for fuel for the Swedish fleet are estimated to have risen from approximately SEK 130 million (EUR 14 million) in 2002 to about SEK 280 million (EUR 29 million) in 2008, bottom trawlers being the segment with the highest increase of fuel costs.

Rising fuel prices are a serious problem for fishing companies, in particular for fuel intense bottom trawlers. If fuel prices remain at the levels seen in recent years it can be expected that vessels in this segment may be forced to leave the fleet. It is not unrealistic that some fishing companies will face bankruptcy unless the higher costs are more permanently offset by higher prices or increased landings. Vessels are coping with higher fuel costs by reducing crew to a minimum and cutting salary.

Employment

Employment in the fishing sector as a whole is decreasing. Total employment in all sectors was approximately 4 100 persons in 2008; 1 800 people had a professional personal fishing license for inland or marine fisheries; 379 were employed in aquaculture and 1 934 in fish processing. Between 2008 and 2009, the number of persons holding a professional fishing license decreased by 6% to 1 688.

Status of fish stocks

Most of the Swedish fishery is conducted in waters that surround Sweden. To the west of Sweden, in the North Sea, the Skagerrak and the Kattegat, progress for stocks has been better than elsewhere in European waters. The number of stocks outside safe biological limits has declined from eight in 2009 to six in 2010, and there are now five stocks that are known not to be overfished compared to only two last year. TACs exceeded scientific advice by 17% for 2010 compared with 37% in 2009. However, the number of stocks for which scientists have not provided advice has increased from ten to eleven.

In the Baltic Sea, two stocks are fished at or below maximum sustainable yield levels. The remaining five stocks are overfished. The average percentage by which the agreed TACs exceeded scientific advice is 16% for 2010 compared with 22% in 2009. The number of stocks for which scientists have not provided advice has decreased from three to two.

In the Baltic Sea, the biomass of the western spawning cod stock fluctuated in recent years around precautionary levels. Fishing mortality has been decreasing since the late 1990s, but is still above sustainable levels. The eastern cod stock is considered to be above precautionary levels and the fishing mortality is at levels that would render maximum sustainable yield. The cod in the Skagerrak and the North Sea is below sustainable levels and the fishing mortality is higher than what is predicted to be sustainable in the long term. The cod stock in the Kattegat has been at a very low level since 2000. Recruitment in recent years has been the lowest in the time series.

The North Sea herring stock has been weak since 2002 with a biomass of the spawning stock fluctuating around precautionary levels and fishing mortality below the fishing mortality estimated to render long term maximum sustainable yields. The stock of western Baltic spring spawning herring, which is partly taken in the Skagerrak and the Kattegat, is outside safe biological limits and fishing mortality is above what is considered to be sustainable. The herring stock in the central Baltic is fished at mortality above precautionary levels since 2005. Precautionary reference points for the spawning stock size are not defined but the spawning stock biomass in 2009 was 54% of the long-term (1974-2009) average. Herring in the Bothnian Sea is in good shape, the spawning stock tripled in biomass in the late 1980s and has remained high since. Fishing mortality has been below precautionary limits since the beginning of the time series (1973). Recruitment seems to have been stable over the last 20 years. The status of the herring in the Bothnian Bay is unknown as there is not enough information available to evaluate trends.

Of the three sprat stocks fished by Sweden, the vast majority is taken in the Baltic (2009 – 75 000 tonnes) and only a small quantity (approximately 2 000 tonnes in 2009) in the North Sea, the Skagerrak and the Kattegat. In the Baltic, the spawning stock biomass has declined from a historic high level in the late 1990s to around the long term average. The fishing mortality is above precautionary levels. The status of the sprat stocks fished by Sweden is unknown in the North Sea and the Skagerrak and the Kattegat.

The stock of north-east Atlantic mackerel is currently at a high level; however there is a risk of rapid depletion as the management arrangements of the main stakeholders are not respected by all states fishing mackerel which results in a total outtake far above sustainable levels.

The state of the stock of Pandalus shrimps in the Skagerrak, Kattegat and the eastern North Sea is uncertain, but survey results indicate a decrease since 2007. Landing data indicate that the stock has been fluctuating without any clear trends since the mid-1990s.

The state of the stock of Nephrops in the Skagerrak and the Kattegat is unknown, although commercial data indicates that the stock is exploited sustainably. High catch rates of small Nephrops over the last years may indicate strong recruitment.

Management of commercial fisheries

The Swedish Board of Fisheries handles the management of commercial fisheries in consultation with local fishermen's organisations. In some exceptional cases, fishermen have their own voluntary regulations to prevent overfishing in certain areas.

For most fisheries there are quotas and technical restrictions (*e.g.* fishing technique, geographical areas, fishing seasons, maximum landings per vessel and time period, minimum landing sizes, limits on by-catches). Technical regulations are decided nationally or by the European Union. Vessels used in commercial fisheries have to be licensed and at least one fisher on board a vessel must hold a personal fishing license.

Fisheries management has moved towards a more long-term perspective with the introduction of recovery and management plans. Most of the commercial fish stocks relevant for the Swedish fleet in the North Sea, the Skagerrak, the Kattegat and the Baltic Sea are managed within multiannual management plans, which gradually have contributed to the decrease of fishing mortality. Rules for determination of TACs and fishing mortality levels are stipulated in the management plans.

Changes in national regulations

In 2008, the EU Council adopted a new cod recovery plan for the North Sea, the Skagerrak and the Kattegat. The recovery plan, which came into force in February 2009, includes an elaborated effort system. Sweden was entitled a maximum level of fishing mortality measured in kilowatt days for different fishing segments. All vessels over 10 metres fishing in the North Sea, the Skagerrak and the Kattegat must have special fishing permits. The kilowatt days were distributed to fishing vessels through these permits. The number of days per vessel has been adjusted according to their fishing method. In 2009, the governments of Sweden and Denmark took further steps to improve the cod recovery in the Kattegat, including an area of spatial protection. The area was divided in different zones, with fishing allowed only in some key areas.

In 2009, following a request to the European Union, the Swedish bottom trawlers fishing for Norway lobster equipped with a selection panel that sorts out cod and other fish species were exempted from the effort regulation. The Swedish request was granted by the Commission in order to encourage selective fishing methods that sort out by-catches of cod and other species. The selection panel fulfils the requirement of catching less than 1.5% of cod.

Since 2007, there is a recovery plan for cod in the Baltic Sea. The number of days for fishing cod in the Baltic Sea by trawl has been reduced for trawlers that also fish in other waters such as the North Sea, the Skagerrak and the Kattegat. Fishing days for vessels with pelagic permits in the Baltic Sea were reduced by 20% in 2009.

In 2009, a new Individual Transferable Quota (ITQ) system was introduced for herring, sprat, mackerel, blue whiting, sand-eel and some other commercial species. The individual quotas were based on historical fishing records. A fisher may only hold up to 10% of the national quota and the fishing rights are distributed for a maximum of ten years. Transfers of the fishing rights need the approval of the Swedish Board of Fisheries. There has been a

consolidation of active capacity in the concerned fleet segment. An evaluation will be carried out at the end of 2010.

In order to prepare for a national management plan for eel, there was a national ban on eel in 2007. Only those fishermen fishing more than 400 kg of eel annually during a reference period could apply for special permits to be able to continue fishing eel. The first evaluation conducted in 2009 showed that fishing mortality had been reduced by 30% since 2007. The Swedish eel recovery plan was approved by the European Commission in October 2009. The plan consists of measures such as improved migration abilities in rivers, release of glass-eel into natural waters and measures to prevent turbine mortality. The hydropower industry has also voluntarily signed a declaration with companies committing to take measures for decreasing turbine mortality. To further reduce the fishing mortality an effort regime was introduced in 2009 that limits the fishing period.

In addition to the protected area in the Kattegat, Sweden opened four other protected areas on the west and east coast to protect key species such as lobster, pike and cod.

Management of recreational fisheries

In principle all waters around the coast and in the lakes are privately owned up to 300 meters from the shoreline. A fisher is allowed to fish in private waters only with the consent of the owner with the exception of angling which is permitted along the coast and in the four big lakes even on private waters. Responsibility for conservation and management of these private waters rests with the owners. However, the Swedish Board of Fisheries is entitled, in exceptional cases, to regulate also these areas. For example, in 2009 there was a new regulation for angling pike in the Baltic Sea (except from the Gulf of Bothnia). Maximum three pikes of between 40 and 70 cm per angler may be kept.

In the four biggest lakes and in the coastal waters, the responsibility lies with the SBF. Many private water-owners have, with state support, created management areas with uniform fishing rules and marketing of recreational fishing opportunities for the public. There are, however, some important exceptions to the general rule of the owners' right to sole disposal of the waters. On the western and southern coasts, fishing is allowed in privately owned waters for the public with a limited number of other gears as well as for professional fishers. Technical regulations, mesh size, time and area closure etc. applies equally for recreational and professional fishing.

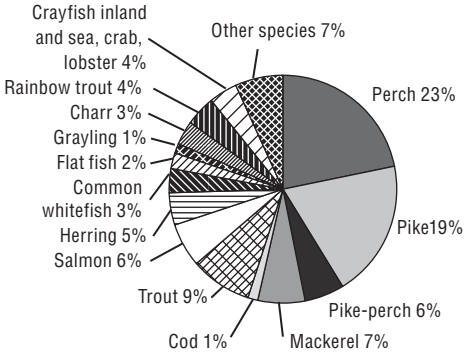
In 2008, about one million of the 6.7 million Swedes aged 16-74 years fished for recreation at least once. About one-third of the recreational fishers were women. Men fished 16 days on average and women fished 9 days on average annually. The total expenditures for recreational fishing in 2008 was estimated at SEK 1.55 billion (EUR 0.16 billion) *i.e.* about SEK 125 (EUR 13) per fishing day or about SEK 1 700 (EUR 177) per year per recreational fisher.

The total number of fishing days in 2006 was estimated 13.8 million days and in 2008, 13 million days. Fifty per cent of fishing days are spent not more than 30 km from people's home and 80% not more than 100 km from their homes; 20% of fishing days are used for long-distance trips, mainly to the Northern part of Sweden; and 87% of fishing days is estimated for rod and reel fishing.

An estimated 18 100 tonnes in 2006 and 11 800 tonnes in 2008 were for direct consumption. About 9 000 tonnes (2006) and 4 100 tonnes (2008) of the catch originated in marine areas 9 000 tonnes (2006) and 7 700 tonnes (2008) in inland waters. The most

important species by weight are perch and pike. Other important species are trout, herring, cod, mackerel, flatfish, common whitefish, grayling, salmon and char.

Figure 26.1. **Distribution of catches in recreational fisheries, 2008**



Aboriginal fisheries

The Sami population in northern Sweden have special fishing rights in specific areas.

Enforcement and control

A risk based monitoring, control and surveillance system developed in 2008 was launched in 2009. The SBF and the Swedish Coast Guard agreed on a strategic yearly programme (control plan) as a steering document for activities during the year which includes objectives for field and administrative activities. Three fisheries have been identified having a high risk: cod trawling in the Baltic Sea, trawling for demersal species in the North Sea, the Skagerrak and the Kattegat, and pelagic trawling in all areas.

In 2007, the European Commission expressed criticism on some member states control systems, including Sweden. As a consequence, the Government increased the control budget for 2008. In mid-2008 an administrative sanction system was introduced for infringements not considered being of criminal nature. The increased budget was used for enhancing lan-ding control capacity and developing the administrative control, especially cross-checking with the Vessel Monitoring System. The vast reduction (30-40 to 6%) in estimated (ICES) undeclared landings of cod from Baltic Sea is probably an effect of the improvements of the fisheries control by the concerned Member States.

The capacity and the capability in maritime surveillance, including fisheries control, have increased in the period. The first of three larger (81 m) multi-purpose surveillance vessels became operational in 2009. Previous surveillance aircrafts were replaced in 2009 by three new ones (Dash 8-Q300). By the end of 2009, electronic logbook became mandatory within the European Union for vessels over 24 meters. The system is a mixture of purchased new software for fishing vessels and adaption of existing software. A new IT-platform was developed in order to have a manageable integrated system.

An interim electronic system was established during 2009 for the management and control of catch certificates following the new EU regulation to prevent, deter and eliminate illegal, unreported and unregulated (IUU) fishing. The EU regulation entered into force on 1 January 2010.

Aquaculture

Aquaculture enquiry

In 2009, a commission of enquiry was tasked by the government to prepare national aquaculture strategy proposal to ensure the development of an ecologically and economically sustainable aquaculture in Sweden. The commission reported amongst other things on the species with the best potential for the aquaculture industry. The salmonid fish mentioned in the report were rainbow trout (*Oncorhynchus mykiss*) for farming in lakes with poor nutrient levels and Arctic char (*Salvelinus lpines*) for cultivation in cold inland lakes with regulated water levels in northern Sweden. Farming of mussels and oysters on the Swedish west coast was also pointed out to have great potential in future.

Fish diseases

Since Sweden became a member of the European Union in 1995, the European Commission has granted additional guarantees for the fish diseases Infectious pancreatic necrosis (IPN), Bacterial kidney disease (BKD) and *Spring viraemia* of carp (SVC). The IPN, BKD and SVC programmes will continue to 2012.

Since 2008; there is work has been undertaken for the declaration and acceptance of the historical free-status of the oyster and mussel parasites *Bonamia ostrea* and *Marteilia refringens*. A disease free-status protects EC member states from transfer and movement of susceptible molluscs species from non-free areas. Since 2009, Sweden has been applying all measures and provisions according to EC Council Directive No. 2006/88 of 24 October 2006 on animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals.

Production facilities, values and volumes

In 2009, Swedish aquaculture production totalled 10 343 tonnes (9 350 tonnes of fish and shellfish for human consumption, 993 tonnes of fish for restocking). Rainbow trout is the dominating species (almost 90% of the fish for human consumption production, 70% of restocking production). Other species are, *inter alia*, Arctic char, eel, salmon trout, blue mussels and crayfish.

Total production value amounted to SEK 280 million (EUR 26.3 million) in 2009 (SEK 211.6 million (EUR 19.9 million) for production for human consumption and SEK 68.1 million (EUR 6.4 million) for production for restocking purposes. An estimated 424 people were working in the aquaculture sector in 2009.

There is a trend to concentrate the production of fish for human consumption. According to a survey published in 2008, six companies accounted for more than half of the total turnover in 2006. Foreign investments in Swedish fish farms have contributed to this development. There is less concentration in the area of production for restocking.

Shellfish production is dominated by blue mussels with volatile production volumes. Production is almost exclusively for human consumption but there are also pilot projects for the production of blue mussels while delivering environmental services such as production of mussel meal and reduction of levels of nitrogen and phosphorus in the water. In 2008, a hatchery for large scale oyster farming was opened.

Tables 26.6, 26.7 and 26.8 show the trend in aquaculture production for human consumption between 2004 and 2008.

Table 26.6. **Number of farm sites (fish for consumption)**

	2005	2006	2007	2008	2009
Rainbow trout	85	83	76	73	77
Eel	3	3	2	2	1
Arctic char	14	11	14	17	14
Blue mussels	27	16	14	17	17
Total[1]	**129**	**113**	**106**	**109**	**109**

1. Excluding cayfish, salmon, and salmon trout.
Source: Statistics Sweden.

Table 26.7. **Production volume of fish for consumption – live weight (tonnes)**

	2005	2006	2007	2008	2009
Rainbow trout	4 968	6 116	4 366	5 789	6 413
Eel	222	191	175	172	
Arctic char	439	444	374	692	
Blue mussels	1 069	1 791	1 168	1 911	2 125
Other	1	3	4	23	812
Total	**6 699**	**8 545**	**6 087**	**8 587**	**9 350**

Source: Statistics Sweden.

Table 26.8. **Production value of fish for consumption**

	2005		2006		2007		2008		2009	
	SEK million	EUR million	SEK million	EUR million	SEK million	EUR million	SEK million	EUR million	SEK million	EUR million
Rainbow trout	113.5	11.8	157.5	17.0	107.1	11.6	157.3	16.4	157.1	14.8
Eel	17.3	1.8	16.2	1.7	14.5	1.6	13.2	1.4		
Arctic char	19.2	2.0	20.4	2.2	17.0	1.8	39.8	4.1		
Other	5.7	0.6	11.2	1.2	6.0	0.6	13.2	1.4	54.5	5.1
Total	**155.7**	**16.2**	**205.3**	**22.2**	**144.6**	**15.6**	**223.5**	**23.3**	**211.6**	**19.9**

Source: Statistics Sweden

Fisheries and the environment

Environmental quality objectives

Sweden has adopted 16 environmental quality objectives (15 adopted in 1999, the 16th adopted in 2005) that provide beacons for all environmental work in the country. The objectives describe the characteristics the environment and the common natural and cultural resources must have in order to be ecologically sustainable. During 2009, a review of the Environmental Objectives System was performed and a government bill was proposed in March 2010. The system will be changed following the Parliamentary decision of 22 June 2010, but the 16 environmental quality objectives will be kept.

The most relevant objectives for fisheries are "a balanced marine environment, flourishing coastal areas and archipelagos" and "Flourishing lakes and streams". The work carried out by the SBF is focused primarily on maintaining and promoting the diversity of

species in our waters and setting up conditions for sustainable stocks of fish. Examples of action taken include the following:

- a proposed closed area for fishing activity in the southern Kattegat was adopted and signed;
- a study including field observations was carried out with good results in 2007-08 with a modified trawl in attempts to reduce by-catches of fish when trawling for crayfish;
- a national recovery and management plan for eel was presented by the Board and adopted by the government in 2008.

Baltic Sea Action Plan, BSAP

The BSAP is a regional multi-sectoral effort for a healthy Baltic Sea ecosystem in 2021. The Swedish government is committed to the implementation of the BSAP. Ecosystem based fisheries management is a central component within the biodiversity and nature conservation segment of the BSAP.

From the point of view of fisheries the BSAP is also timely as it opens up for synergies with the reform of the Common Fisheries Policy and other relevant European initiatives for fisheries management, particularly the EU Marine Strategy Framework Directive and the EU Strategy for the Baltic Sea Region.

Sweden has prepared a National Implementation Plan for the BSAP and a Government Communication on Measures for a Living Sea was adopted by the Cabinet of Ministers in 2010 and then presented to Parliament. These documents, which highlight the implementation of BSAP, are a priority for the Swedish Government and cover all four segments of the BSAP. They include actions in the field of fisheries management as proposed by the SBF in 2009.

The national plan emphasises the development of management plans for MPAs, restoration programmes for habitats essential for fish, the selection of indicators and assessment of the status of non-commercial species, the development and effective implementation of long term management plans for commercial species with focus on eel, salmon and cod but also small pelagics. Sweden does also emphasise the development of a knowledge base for the future development of management plans of non-commercial species. Support to local participative management is also foreseen. Additional public funds will be mobilised for the implementation of the BSAP.

Local fishermen participation in the management of Kosterhavet marine national park

The Swedish fisheries co-management initiative was launched in 2005 and consisted of support and follow up of the work of six pilot cases during two years. The progresses made by local initiatives, the methodological approach and work carried out by the SBF as well as recommendations for a more formal institutionalisation of local co-management in fisheries were reported to the Swedish Government in 2007.

The local co-management initiative in northern Bohuslän has been one of the successful cases. During the first two years, it delivered a vision for the fisheries in the area, marine ecology courses for fishermen, courses on the history of the fisheries and practical fisheries for scientists, managers and policy makers, a label for local products, tests of environmentally friendly gear and practical measures to facilitate inspection and control onboard.

These co-management precedents in the local fisheries have enabled the involvement of local fishermen in the management of a marine national park inaugurated in 2009 in the Skagerrak Sea.

The main purpose of the marine national park Kosterhavet is to protect marine biodiversity, particularly deep-sea corals present in the Norwegian Trench. The biodiversity supports a marine ecosystem that provides a bundle of services crucial to local communities, including shellfish. A twin park is being inaugurated on the Norwegian side.

The history of Kosterhavet national park started in the 1970s and has been rich in conflicts and controversies. The process has been far from easy and the approach towards conservation and the involvement of local communities has changed over the years. More recently, local knowledge has been mobilised to develop a management plan for the national park which allows for sustainable fisheries to continue within the boundaries of the park. A remarkable aspect from the perspective of participation in natural resources management is that local stakeholders, including the local fishermen's co-management initiative, have been invited to join the national park's steering group. The strategic plan of the Convention on Biological Diversity (CBD) highlights that local communities shall be effectively involved in the implementation of the Convention; from a CBD perspective the building of Kosterhavet is an interesting example to learn from. Whether it succeeds in terms of implementation remains to be seen.

National strategy and action plan for alien species

The Swedish Environmental Protection Agency published in 2009 a proposal for a national strategy and action plan to protect our natural heritage from alien species and genotypes. There is at present no *unified* Swedish legal framework for preventative work and eradication and control of invasive alien species in Sweden. Existing regulations are primarily intended to protect different economical interests and sectoral activities such as aquaculture and fisheries. Protection of the wild biological diversity is therefore, weak, *i.e.* in many cases there are no regulations concerning granting of permits or notification to the authorities. Alien species are a cross-sectoral question that affects, *i.e.* trade, infrastructure development, agriculture, forestry, horticulture, tourism and recreation.

In Spring 2010, the national strategy was accepted by the Government and incorporated in the bill for the Environmental Objectives. The growing problem with invasive alien species must be addressed urgently. The government has therefore tasked the Swedish Environmental Protection Agency to establish a joint co-operative group for alien species, composed of representatives from the authorities and different target groups. There is also on-going work at the EU-level, whereby the European Commission proposed in 2008 a strategy to deal with invasive species.

Government financial transfers

Transfer policies

Direct payments to the sector are mainly made within the EU operational programme for the fisheries sector 2007-13. There is also some minor support paid through the EU Common market policy. The main cost reducing transfer is the fossil fuel carbon dioxide and energy tax exemption for registered fishing vessels. In addition, due to the EU trade restrictions (in particular for processed products) and the EU price intervention system there is a Market Price Support (MPS) but no quantitative estimations are available for Sweden.

The operational programme support is financed by the European Fisheries Fund and the Government (or other public institutions). The administration of the programme is shared between the Swedish Board of Fisheries and the County Administrative Boards and supported by a national strategic plan. SBF and the County administrations have the mandate to grant aid, but within different fields of support. Other departments at the SBF are responsible for disbursements and controls. Table 26.9 shows the direct payments for the sub-sectors and an estimate of the fossil fuel tax exemptions.

Table 26.9. **Government financial transfers – Direct payments and cost-reducing transfers**[1]

	2008		2009	
	SEK million	EUR million	SEK million	EUR million
Marine capture fisheries				
Decommissioning	4.3	0.45	54.0	5.1
Other direct payments	22.6	2.4	11.2	1.1
Fossil fuel exemptions	185.6	19.3	n.a.	n.a.
Aquaculture				
Direct payments	0.9	0.1	10.3	1.0
Marketing and processing				
Direct payments	25.7	2.7	14.6	1.4

1. Classification is according to the guideline for annual statistical reporting to the OECD.

Source: Estimates by the Swedish Board of Fisheries.

The general services to the sector (Table 26.10) are mainly provided by the SBF and the Swedish Coast Guard. Provision of infrastructure of is made within the EU structural programme.

Table 26.10. **Government financial transfers – General services**[1]

	2008		2009	
	SEK million	EUR million	SEK million	EUR million
General services				
Management	64.2	6.70	67.6	6.4
Research[2]	169.1	17.60	189.7	17.9
Enforcement and control	163.8	17.10	187.5	17.6
Provision of infrastructure	2.3	0.24	1.1	1.0

1. Classifications according to the guideline for annual statistical reporting to the OECD.
2. Including some freshwater research.

Source: Estimates by the Swedish Board of Fisheries.

In terms of social assistance, there is an unemployment benefit association for fishers that is part of the general social welfare system in Sweden. This association follows the general rules concerning unemployment benefits in that an unemployed person receiving benefits must be at the disposal of the labour market. There are certain specified circumstances when a fisher may receive unemployment benefits.

Between 2004 and 2009, the yearly average number of members decreased by 40% mainly due to fishers leaving the profession and a relatively sharp increase of the membership fees in 2007. In 2009, there were 719 members on average. In total, SEK 15 million (EUR 1.4 million) were paid to fishers in 2009, compared to SEK 20 million (EUR 2.1 million) in 2008.

In terms of structural adjustment, the Swedish operational programme for 2007-13 includes objectives for reduction of fleet capacity (in tonnage and engine power) to be achieved in 2010 and 2015 respectively. Table 26.11 shows the objectives expressed in tonnage (Gross tonnes – GT).

Table 26.11. **Fleet reduction objectives and measures**

	2007 (starting point)	2010 (objective)	2015 (objective)	Measure
Bottom trawlers Northern prawn	4 815 GT	–144 GT (–3%)	–481 GT (–10%)	To be decided
Bottom trawlers Cod	9 482 GT	–1 233 GT (–13%)	–4 741 GT (–50%)	Decommissioning schemes
Pelagic trawlers and seiners	23 914 GT	–1 913 GT (–8%)	–7 174 GT (–30%)	Introduction of ITQs

Source: Operational programme for the fisheries sector in Sweden 2007-13.

Two decommissioning schemes were initiated in 2008-10. In both schemes the focus is on decommissioning cod bottom trawlers in two areas: *i)* the Baltic Sea; and *ii)* the North Sea, the Skagerrak and Kattegat.

Decommissioning

The two Swedish decommissioning schemes initiated in 2008-10 were included in national plans for adapting fishing effort in accordance with EU legislation. According to this legislation a recovery plan decided by the EU Council shall be followed by national plans for adapting fishing effort. The decommissioning schemes have defined objectives in terms of capacity expressed in tonnage (GT) and power engine (kW) within the plans for adjustment of the fishing fleet.

The fleet segments and fisheries targeted in these campaigns are not open for entry and the exit capacity cannot be used for the entry of new capacity [within the EU exit/entry system for tonnage (GT) and engine power (kW)] in any segment of the fleet]. Hence, all permits linked to the vessel are withdrawn when a vessel is decommissioned with public aid. The fisher may keep the personal licence (unless aid for compensation for leaving the work as a fisher has been granted). The schemes have been designed as a one-off adjustment programme and, consequently, there are no additional campaigns planned for the targeted segments.

Participation by vessel owners was voluntary. They submit tenders with indications of aid requested to scrap the vessel. Individual negotiations are held with each applicant to decide the final financial support. As there is limited funding available, applications are prioritised according to region, impact on reduction of fishing effort, and level of aid requested. If support is granted, the vessel owner is not obliged to scrap the vessel and claim the disbursement of the grant. The vessel owner is given a period of six months to scrap the vessel and receive payment once this is done.

The schemes are funded through the European Fisheries Fund and the Swedish Government. There has been no beneficiary-pays principle in the campaigns. *ex post* evaluation of these scrapping campaigns will be part of a mid-term evaluation of the Swedish structural programme for the European Fisheries Fund.

Bottom trawler fishing in the Baltic Sea (2008)

Following a decision by the EU Council in 2007 to establish a multiannual plan for the cod stocks in the Baltic Sea, the Swedish Board of Fisheries adopted a plan for adapting the fishing fleet on 18 March 2008.

The plan aimed at increasing profitability in the Swedish bottom trawler segments and to lower fish mortality in the Baltic Sea. In the campaign six vessels with a total tonnage of 1 040 GT and engine power of 3 306 kW received aid for scrapping. The total amount of aid granted is SEK 54 million (EUR 5.6 million).

Bottom trawlers fishing in the Skagerrak, Kattegat and in the North Sea (2009-10)

The EU Council decided in 2008 to establish a long-term plan for cod stocks in the North Sea, the Skagerrak, and the Kattegat, the eastern part of the British Channel, West of Scotland and in the Irish Sea. Following this decision the Swedish Board of Fisheries adopted a plan on 31 March 2009 for adapting the Swedish fishing fleet targeting cod in relevant areas, *i.e.* the North Sea, the Skagerrak and the Kattegat.

A calculation by the SBF of the need for reduction of the trawler fleet, using a bio-economic model, showed a long-term surplus of capacity of approximately 55% of the vessels trawling for cod with a length less than 24 meters equivalent to 12 vessels, 63% of the vessels trawling for cod with a length between 24 and 40 metre (5 vessels) and 52% of shrimp trawlers with a length less than 24 metres (37 vessels).

The Swedish Board of Fisheries has estimated that it is possible to reduce the fleet with 4 700 GT and approximately 20 000 GT until 2015. These values correspond to 40% of the capacity with a special permit during 2009. With public financing the cost was estimated to SEK 225 million (EUR 21 million).

By 31 July 2010, 24 vessels with a total tonnage of 1 485 GT and an engine power of 6 578 kW had been granted aid for permanent cessation of fishing through scrapping through this campaign. The total amount of aid granted is SEK 97 million (EUR 9 million). The result of this campaign remains to be evaluated as there is a six-month period for the vessel owner to actually scrap the vessels and claim disbursement of the financial support.

Post-harvesting policies and practices

EU legislation sets minimum hygiene standards for the production and marketing of fish and fish products. For the national implementation the Sweden the National Food Administration (NFA) is the responsible authority.

When new maximum levels for certain contaminants in foodstuffs were set by the European Union in 2006, Sweden and Finland were granted derogation until 31 December 2011 from some of the rules related to dioxin and dioxin-like PCBs. The derogation implies that salmon, Baltic herring, lamprey, trout, Arctic char and vendace roe can be sold on the domestic market even if the maximum limits for dioxin and dioxin-like PCBs are exceeded. A condition for derogation is that there is sufficient information (dietary advice) to consumers.

With regard to certification, the market for eco-labelled Swedish or imported fisheries products is developing rapidly in Sweden. In recent years a number of Swedish fisheries have been certified by private certifying organisations, such as KRAV and the Marine Stewardship Council.

Another new labelling system, focusing on traceability, called NARFISKAT was introduced on the Swedish market in 2008 on the initiative of the fishing industry. The aim is to meet consumer demands for information on the origin of the fishery products. The main criteria for NARFISKAT are that the fish is caught locally defines as the seas surrounding Sweden or in inland waters, that the fish is caught and sold legally and that the fishery products are fully traceable from the fishing vessel to retailer.

A phenomenon influencing consumer decision on the Swedish market when it comes to purchase of fish products is different "fish-lists". These lists function as guides for consumers that want to buy sustainable seafood. Lists are provided by a number of environmental NGOs. Another fish list is made by The Swedish Environmental Management Council and is developed for companies and public organisations and offers guidance in the field of Green Public Procurement.

Processing and handling facilities

There were 214 companies with 225 processing plants with a total production value of SEK 4 181 million (EUR 435 million) in 2008. Compared to 2007, the production value decreased by 4%. The average number of employees recalculated to full time jobs where 1 773 (the number of employees being 2 165), which is a decrease with 5% compared to 2007. Gross value added and gross revenue in 2008 were relative stable compared to 2007. Production is mainly directed towards herring and cod, but also, to some degree, prawn, salmon, cod roe and mackerel.

Concerning the secondary industry a large part of the raw material is imported. Most of the import originates from Norway. The secondary industry is, compared to the primary, less dependent on Swedish landings but more on imports.

Markets and trade

With regard to domestic consumption, the general trend experienced from producers, wholesalers and traders is that consumption of fresh fish has declined while the consumption of prepared fish and high value species has increased. There is also a significant increase in demand for eco-labelled fish products, probably due to the debate and increased media coverage for news concerning overfishing and declining fish stocks. In 2009, Sweden imported seafood for almost SEK 20 billion (EUR 1.9 billion) and exported for about SEK 15.4 billion (EUR 1.4 billion) (Table 26.12). Sweden's imports of fishery products mainly come from Norway and Denmark. Much of the salmon imported from Norway is re-exported to the rest of Europe, which sharply raises the figures for Sweden's export and imports of seafood products.

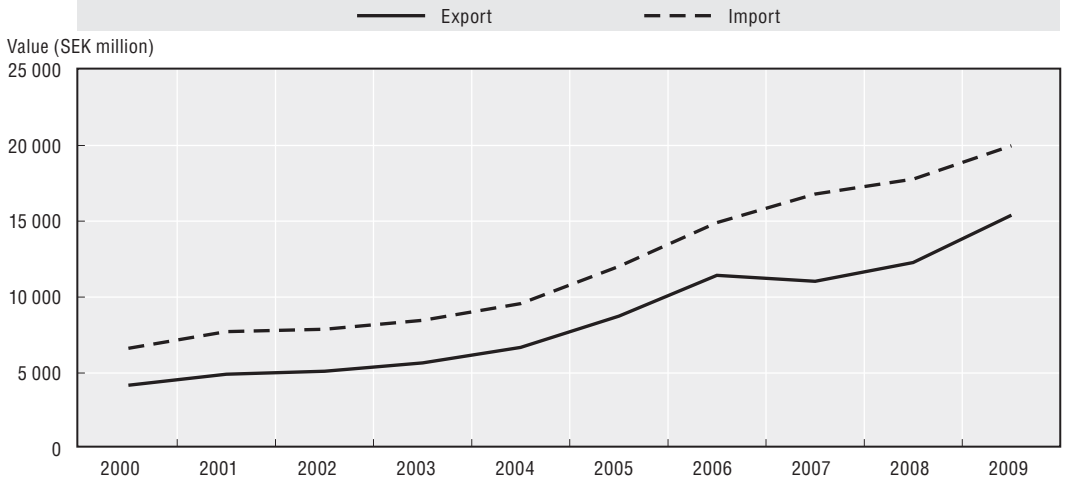
Foreign trade has increased sharply in the last decade. Since 2000, exports have increased by 367% and imports by 301% (Figure 26.2).

Table 26.12. **Trade in seafood, 2000-09 (volume and value)**

CN-number	Product	Export '000 tonnes	Import '0000 tonnes	Diff. '000 tonnes[1]	Export, SEK million	Import, SEK million	Diff., SEK million
0 301	Live fish	0.4	0.09	0.3	50	29.3	21
0 302	Fresh or chilled fish	380.5	325.90	54.6	10 196	10 856.0	–659
0 303	Frozen fish	52.1	9.80	42.3	296	238.0	58
0 304	Fish fillets	36.6	80.30	–43.7	1 693	3 665.0	–1 972
0 305	Dried, smoked or salted fish	33.8	39.30	–5.5	1 938	2 008.0	–70
0 306	Crustaceans	2.2	20.10	–17.9	145	868.0	–723
0 307	Molluscs	0.9	2.90	–1.9	37	106.0	–69
1 604	Prepared fishproducts	23.3	38.90	–15.6	909	1 178.0	–268
1 605	Prepared crustaceans and molluscs	1.8	17.30	–15.4	142	1 026.0	–884
	Total	**531.7**	**534.60**	**–2.9**	**15 406**	**19 972.0**	**–4 566**

1. Calculated on difference in tonnes (not thousand tonnes)
Source: Statistics Sweden.

Figure 26.2. **Trade in seafood, 2000-09 (value)**



Outlook

Achieving sustainable fisheries continues to be an important challenge. A review of the EU Common Fisheries Policy has been initiated and the directions of the policy from 2013 onwards are discussed. One important aspect will be how to implement the ecosystem approach in fisheries management. At national level there are preparations for a reorganisation of the fisheries administration, where the aim is to integrate fisheries management issues in a new Swedish agency for marine and freshwater environmental issues in 2011. The new agency will have a broad mandate to work with issues linked to the management of waters, not only fisheries but also other environmental issues and marine spatial planning.

In 2008 and 2009, a number of measures were implemented in Sweden to reduce fleet overcapacity. EU fish stocks management and recovery plans are also being implemented. It is likely that these efforts will yield positive results and contribute to improved profitability for the fleet. However, the development of price at first sale, the level of the fuel costs, and the development of interest rates are likely to continue to be important factors for profitability.

The processing industry will probably recover from the negative effects of the financial crises in 2008-09. No major changes are expected in aquaculture in the short-run. In the longer run, parts of the sector may develop, such as the production of blue mussels with the purpose to produce mussel meal and to reduce the nitrogen and phosphorus levels in the water, provided that production achieves profitability.

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PART III

Chapter 27

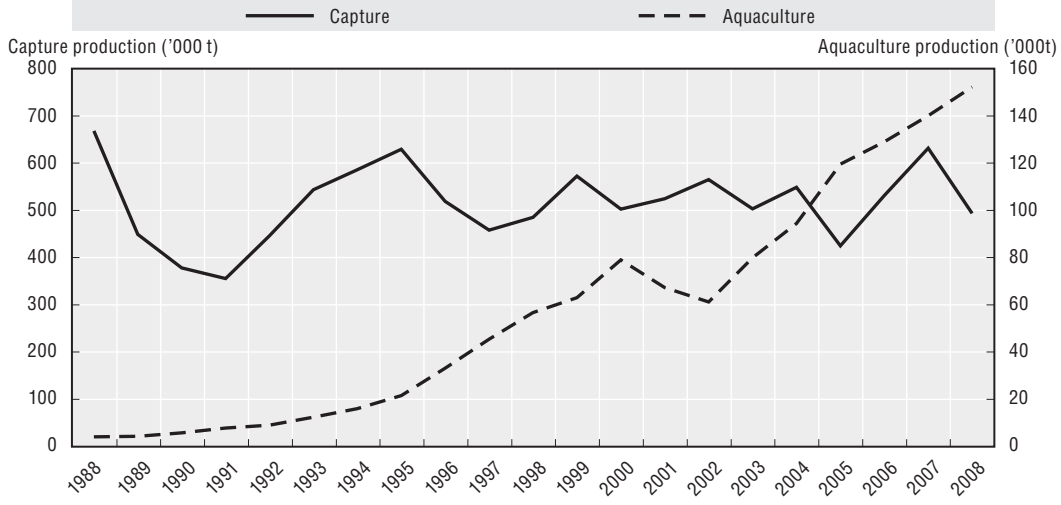
Turkey

Turkey

Summary of recent developments

- The Turkish fishing sector consists of an artisanal and an off-shore fishery with multi-gear and multi-species characteristics. In 2008, total production from marine capture, inland fishing and aquaculture was about 453 000 tonnes, 41 000 tonnes and 152 000 tonnes respectively. Over 90% of the total marine catch is made up of ten species (mainly small pelagic). Turkey is one of the leading European aquaculture producers.
- A regulation for the anchovy purse seine fishery was introduced in 2007 to prolong the fishing period. A fishing quota for striped venus was set at 35 000 tonnes as of 2008. The Ministry of Agriculture and Rural Affairs plans to introduce a quota system for anchovy, sprat and mackerel.
- In the context of Turkey's accession process to the European Union, the fisheries sector has been subject to comprehensive review procedures in terms of harmonisation with the European Union's acquis on fisheries. Newly developed pilot applications have been introduced to create a framework for exploitation of fisheries marine resources including the development and pilot application of a vessel monitoring system, Fisheries Information System, construction of offices at landing sites, regulations on market standards, preparation of preliminary fisheries management plans and a preliminary sector strategy, draft law amendments to form and strengthen the legal basis in terms of enforcement and sanctions for new applications.

Harvesting and aquaculture production (tonnes)

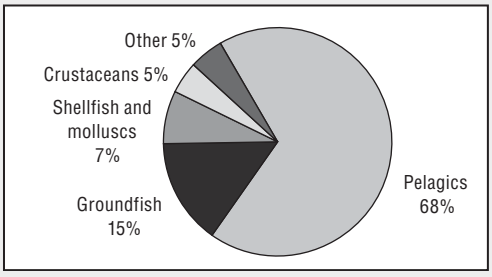


Source: FAO FishStat Database.

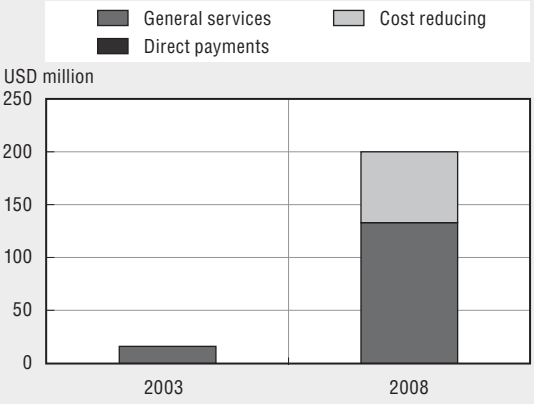
Key characteristics of the sector

- The volume of landings increased by 23% to 453 113 mt compared to 2007, mainly due to pelagic landings (anchovy). Other important species of the Turkish capture fishery are Atlantic bonito, pilchard, horse mackerel, sprat, whiting, grey mullet and hake.
- Domestic consumers have a preference for fresh fish, in particular anchovy. Annual per capita consumption is stable at around 7 kg.
- Many of the general service transfers serve to align Turkish management systems with the European Common Fisheries Policy. For example, monitoring systems have been improved and the landing registration infrastructure has been expanded.
- Over the last decade, fish trade increased considerably in Turkey. Imports were dominated by processed and frozen fish products. Given the increase in aquaculture production, fish meal is an important import commodity. European countries are the main suppliers of seafood to the Turkish market, as well as the main export destinations. In 2008, Turkey's fishery trade surplus was about USD 176 million.
- In 2008, there were 17 161 registered vessels with a total tonnage of 187 101 GT. Although the fishing fleet decreased from 2004 to 2008 by approximately 3%, the tonnage remained unchanged.
- With regards to employment, female participation is particularly high in the processing sector.

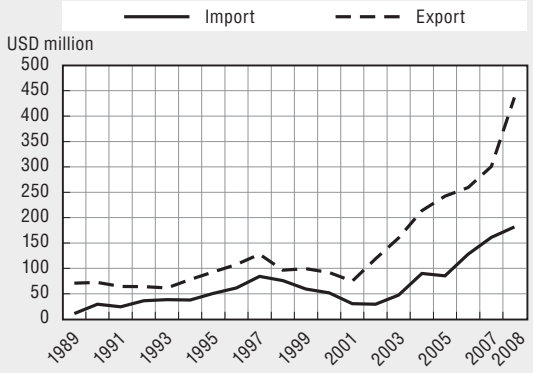
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fisher	50 000	53 893	7.8
Number of fish farmers	4 020	7 610	89.3
Total number of vessels	17 319	17 816	2.9
Total tonnage of the fleet	. .	185 760	. .

Legal and institutional framework

The Ministry of Agriculture and Rural Affairs (MARA) is the main competent authority responsible for fisheries and aquaculture. The MARA conducts its services and activities through four General Directorates and 81 Provincial Directorates.

The Law-1380 on Fisheries is the main legislative instrument governing fisheries, aquaculture and fisheries-related activities. The law empowers the MARA to develop and implement policies on fishing, aquaculture, conservation of fisheries resources, quality, safety and hygiene of fishery products, and fisheries research.

Fishing activities are regulated by two distinct Notifications, formerly circulars, namely Notification 1/1 regulating commercial fishing and Notification 1/2 regulating recreational fishing.

In parallel with Turkey's accession process to the European Union, Turkish fishery has been subject to a review in order to ensure harmonisation with the EU-fisheries *acquis*. Although, to a certain extent, progress in the strengthening of the legislative framework has been recorded, further institutional capacity building is required, particularly for sector planning and resource management.

Draft amendments have been made to the existing Fisheries Law 1380 in order to impose provisions on, *inter alia*, vessel monitoring systems, data collection, designation of landing ports, marketing of fishery products and market standards and the establishment of producer organisations. The proposed provisions are expected to be effective within 2010 following their approval by the Turkish Parliament.

Technical work on the preparation of the following plans and programmes is underway.

- Action plans for:
  - marine fisheries management regimes with alternative instruments (quota/TAC, fishing capacity and effort, days at sea, rights-based, etc.);
  - multi-annual stock management regimes for major stocks;
  - further development of national surveillance, monitoring and control; and
  - an integrated data collection/monitoring programme, including biologic, economic, catch data modules.
- A programme for fishing capacity reduction and monitoring through alternative tools, including fleet adjustment.
- A strategic plan for fisheries research.

These plans will be completed in 2011.

The existing fisheries management regime does not involve annual Total Allowable Catch (TAC) for commercial fish species, expect for bluefin tuna fishing which is regulated by the rules of ICCAT, and striped venus clam for which a quota has been set for the fishing year 2008.

Capture fisheries

Volume and value of commercial landings

Total fishery production decreased by 16% from 772 323 tonnes in 2007 to 646 310 tonnes in 2008. In 2008, production from marine capture, inland fishing and aquaculture was 453 113 tonnes, 41 011 tonnes, and 152 186 tonnes respectively. Compared

to 2007, inland fish production decreased by 1.7% while marine capture fisheries increased by 20.4% and aquaculture by 8.4%.

The main factor contributing to growth in marine capture was the increased catch of anchovy, which typically accounts for the bulk of marine capture. Anchovy accounted for 75% and 63% of total marine capture in 2007 and 2008, respectively. Natural variations in the anchovy stocks have generally a significant effect on the marine capture landing volume and they therefore directly affect total production. Atlantic bonito, pilchard, horse mackerel, sprat, whiting, grey mullet and hake were the other main marine commercial fish species landed. The total fishery production of Turkey between 2004 and 2008 is given in Table 27.1.

Table 27.1. **Total fishery production between, 2004-08 (tonnes)**

Fisheries type	2004	2005	2006	2007	2008
Marine capture	504 937	380 381	463 074	589 129	453 113
Inland fishing	45 585	46 115	44 082	43 321	41 011
Aquaculture	94 010	118 277	128 943	138 773	152 186
Total	**644 522**	**544 773**	**661 991**	**772 323**	**646 310**

Source: Turkstat.

Compared to 2007, the volume of landings increased in 2008 by 23% to 453 113 tonnes, which was largely driven by an increase in pelagic landings, but the value decreased by 17% to TRY 982.9 million (approximately USD 794.8 million).

In 2008, pelagic landings made up 65% of the total value and 79% of the total volume, compared with 82% of the total value and 70% of the total volume in 2007.

From 2007 to 2008, the volume and value of landings of shellfish and crustacean decreased by 21% and 2%, respectively. In 2008, shellfish and crustacean landings accounted for 11% of the total by weight (52 690 mt) but 5% by value (approximately USD 68.6 million).

Table 27.2. **Landings by volume and value, 2006-08**

Landings	2006		2007		2008	
	Volume (tonnes)	Value ('000 TRY)[1]	Volume (tonnes)	Value ('000 TRY)[2]	Volume (tonnes)	Value ('000 TRY)[3]
Marine fish	409 945	1 385 655	518 201	1 077 682	453 113	982 973
Shellfish and crustacean	74 921	136 557	66 956	84 886	52 690	82 811

1. 1 USD = 1.3790 TRY.
2. 1 USD = 1.4315 TRY.
3. 1 USD = 1.2367 TRY.

Source: Turkstat.

Fleet structure

In 2008, there were 17 161 vessels registered with a total tonnage of 187 101 GT. Although from 2004 to 2008 the fishing fleet decreased by 5.5%, the tonnage remained almost unchanged overall. The majority of fishing fleet is comprised of small vessels: in 2008, 94.7% of fishing vessels were less than 20 m in length. Of the 17 161 vessels, 17% had an engine capacity greater than 100 HP and 2.8% had ten or more crew. Nearly half of

the total fishing fleet is based in the Black Sea; the majority of large vessels operate in the Sea of Marmara and the Black Sea.

All fishing vessels involved in commercial fishing are legally required to have a license. Under the existing management regime, fishing license is granted to a given registered vessel for a particular fishing, not to a person. The fishing license is valid for two years. If the validity of the license is not extended within three years following its (two-year) validity period, the license is permanently suspended (during three-year period of extension the vessel has no right to fish). On the other hand, fishers operating the vessels should have a fishing license which is valid for five years. Legally, only Turkish citizens can be fishers. Foreigners may own a Turkish fishing vessel but are not allowed to fish. Fishing licenses are associated with a particular vessel, not a person. While it is obligatory to obtain a license to participate in a commercial fishery, it is not required for recreational fishing.

State aid allocated to the fishing industry in the 1970s and 1980s led to the expansion of fishing capacity, creating increased pressure on fish stocks. In 1991, a limitation was imposed on the issuing of fishing licences in order to reduce fishing capacity. In this connection, a limited number of licences were granted to fishing vessels for short periods in 1994, 1997 and 2001. There has been a decline in the number of vessels since 2002 when the size of the fleet was frozen. New entries are only allowed when a vessel of the same size exists in the fleet. In such cases, a maximum 20% increase in length is tolerated. Similarly, in case of modification or modernisation of fishing vessels, a maximum of a 20% increase in size is allowed. For both modifications and replacement of vessels, engine power or tonnage are disregarded.

There are no restrictions on the fishing region/area where a licensed particular vessel operates. However, most vessels are generally operating at local or sub-regional level. A registered fishing vessel, thus, may fish in all waters of Turkey. Fishing vessels are classified as purse seiners, trawlers, multi-purpose vessels, carriers and other types under the current vessel registry system.

Employment in fishery sectors

In 2008, overall employment in the harvesting sector (*i.e.* marine and inland fisheries) was 53 893. Of these, 45 872 were employed in the marine fishing sector and 8 021 were employed in inland fisheries. In the same year, 7 610 and 11 464 people were employed in aquaculture and processing, respectively. Compared with 2008, employment in the processing sector decreased by 4.6% in 2009.

Status of fish stocks

Current management systems lack regular stock assessment studies for the determination of the status of commercial fish stocks. Therefore, assessments of the status and trends in fish stocks are done based on fishery statistics produced by surveys which indicate variations in abundance of most of commercial fish stocks.

A project entitled "Introduction of stock assessment to the fisheries management system of Turkey" was completed in June 2010 under the European Union's IPA Programme. The project aims to establish and improve necessary capacity required for ecosystem-based fisheries resource management in Turkey, by creating a framework for the introduction of stock assessment to the national fisheries management regime.

Preparatory work continues on the establishment of a mechanism to monitor the biological parameters of catches at the landing ports.

Management

Management of commercial fisheries

Technical measures are the primary tools for the regulation of fisheries in terms of conservation of resources and limitation of fishing effort. The Notification 1/1 regulating commercial fishing includes provisions on minimum mesh size, depth, and distance from the coast, fishing gear, region, area, time, species, minimum legal size/weight of catch, and maximum percentages of by-catch. Every kind of fishing activity is prohibited in the area within a radius of 500 m off the river estuaries. Trawling is completely prohibited in the Sea of Marmara in order to protect demersal species. In other seas, trawling is prohibited in some bays and gulfs and in certain areas. There are also areas that are totally closed to any types of fishing activity.

A regulation for anchovy purse seine fishery was imposed in order to prolong the fishing period by setting a daytime fishing (from 4 to 6 pm). The aim of this regulation is twofold: to facilitate more effective controls at sea over anchovy fishing and to restore the declining fish feeding on the anchovy.

A fishing quota for striped venus has been set at 35 000 tonnes for 2008. MARA plans to introduce a fishing quota system for anchovy, sprat and mackerel as from 2009.

Policy Development

At the national planning and policy levels, fishery is generally considered a sub-sector of agriculture in Turkey. The existing fisheries policy is not based on detailed, comprehensive strategy/planning documents, but is generally formulated under the national development plans prepared by the State Planning Organisation which provides broad guidelines and framework on how the fisheries sector may contribute towards national objectives and strategy. Priority areas identified by the 9th Development Plan (2007-13) in relation to fisheries include the restructuring of the fisheries sector, the sustainable exploitation of marine fish stocks supported by stock assessment, the integration of environmental considerations into fishery and aquaculture, institutional re-organisation and capacity building, strengthening technical infrastructure and improving competitive advantage and profitability.

Work devoted to the alignment of Turkey's fisheries sector with that of the European Union has accelerated reviews of the sector with relevant key stakeholders. Strategic policy and management documents, including Preliminary Fisheries Management Plans and a Fisheries and Aquaculture Sector Study were prepared in 2007 under a project which was supported by the Phare programme of the European Union. The documents set a policy framework with priorities for sustainable use of fishing resources as well as timelines. The development of the processing and aquaculture sector, the strengthening of institutional capacity, the introduction of fish stock assessments as a tool for management system and strengthened enforcement are examples of priorities set within the strategic documents to comply with the Common Fishery Policy of the European Union.

An institutional and policy framework for the establishment of a Fishery Producer Organisation has been developed. In recent years, fishers associations have undergone a re-structuring process. In May 2010, there were 542 fishery co-operatives, 14 regional unions, 22 fisheries unions and one Central Union of Fishery Co-operatives.

Management of recreational fisheries

No new regulation has been introduced on recreational fisheries between 2006 and 2008. In Turkey, no license is required for recreational fishing activities. An identification document is granted to amateur fishers upon request. The volume of recreational fishing is estimated to be low compared to commercial fishing.

All data on recreational fisheries is incorporated into the Fisheries Information System. The system includes real-time data on recreational fishing licences and the licence holders.

Monitoring and enforcement

A satellite-based Vessel Monitoring System (VMS) has been established. The application of the VMS was launched in 2007 with vessels registered for Bluefin tuna fishing. The vessels registered for Bluefin tuna fishing are required to have a VMS and to submit regular position reports. MARA plans to gradually extend the requirement for the other vessels over a particular length.

Thirty-four port offices have been constructed for the collection of landing data. Data to be collected from these ports will be transferred to the central Fisheries Information System. Technical work on the integration of biological parameters of catches into the Fisheries Information System is underway.

Compliance with the catch certification required by the EU's Regulation 1005/2008 to prevent, deter and eliminate illegal, unreported and unregulated fishing is supported through the Fisheries Information System.

Compliance controls are routinely carried out at marine and inland waters, landing points, wholesale and retail fish markets, processing establishments and cold storages.

The update of the vessel registry system was completed in 2008. The system has been integrated into the Fisheries Information System which comprises data on landings, logbooks, vessel monitoring system, sale notes, observer and control forms, first buyer notification, quota monitoring, and storage notification.

Since 1 January 2010, all fishing vessels over 15 m are under the legal obligation to have an Automatic Identification System (AIS).

Aquaculture

Production facilities

In 2009, there were 1 277 inland and 339 marine farms and their production capacity were 104 629 and 134 121 tonnes, respectively. About two-thirds of these farms were rainbow trout farms. The remainder were mainly sea bass and sea bream farms. Aquaculture production is mostly operated by small- to medium-size family-operated units.

Production volumes and values

Aquaculture production in Turkey has shown an overall growth since its beginnings in the mid-1970s. Turkey is currently the third largest farmed finfish producer in Europe and first largest producer of rainbow trout, and the second largest producer of both sea bass and sea bream. Its rapid development has been driven by various factors including the relatively high demand for fish, the availability of sheltered sites and good water quality, government support, high private sector interest for aquaculture investment, rapid development of specific marine hatchery technology, and low labour costs.

In 2008, aquaculture production accounted for 23.5% of the total fish production. Contribution of aquaculture to Turkey's total volume of fish production was approximately 18% and 23% in 2007 and 2008, respectively. Overall production from aquaculture in 2008 was 152 186 mt. This was made up mainly of rainbow trout (42%), sea bream (20%) and of sea bass (32%). The proportions of production from marine and inland aquaculture in the total volume of aquaculture production in 2008 were approximately 56% and 44%, respectively.

The total value of aquaculture products in 2008 was about TLY 850.6 million (approximately USD 687.8 million).

Policy development

A number of regulations on aquaculture have been imposed. Aquaculture Legislation was amended and aligned with EU regulations including fish welfare in 2009. In addition, ministerial notifications related to site selection and monitoring for fish farms were put into effect in 2007 and 2009, respectively.

Recently, the Turkish Government has developed a National Marine Aquaculture Development Plan to minimise conflicts and provide a stable base for future growth of the aquaculture sector. To prevent negative impacts of fish farms, some measures were introduced that took into account the comments of relevant stakeholders.

In addition to aquaculture regulations and planning, several scientific national and international projects have been carried out to improve aquaculture sustainability.

Marine aquaculture zones were originally determined by MARA in 1988. Due to the rapid expansion of the aquaculture sector and its related needs, the potential zones were reviewed in 1993, 1998 and 2000. In 2008, in accordance with the provisions of the amended Environmental Law-2872, which came into force in 2006, and the Notification on Defining Sensitive Enclosed Bays and Gulfs Areas in Coastal Waters Closed to Fish Farms, amendments were made to marine aquaculture zones or to potential aquaculture development sites. In addition, some inshore marine farms were moved to new offshore areas.

There have been several pilot/trial projects on the farming of certain fish species.

In order not to exceed quota limits, the issuing of permits for opening new tuna farms has been stopped and a limitation has been imposed on production and export volumes of approved projects as of 2004.

In dammed lakes, further areas opened to cage culture under a protocol signed between MARA and Ministry of Energy and Natural Resources.

The aquaculture sector was supported through access to low-interest credits.

Post-harvest practice and policies

Processing sector

In 2009, there were 197 licensed large-or medium-sized fish processing facilities nationwide. Of these, 107 were approved for export to the European Union, 30 to third countries (outside of the European Union) and 60 were licensed for the domestic market only. Initial investment in the majority of these factories took place between 1977 and 1997. In recent years, processing facilities have been established to handle fresh product from aquaculture. At the end of 2009, the total number of people permanently employed in processing was 4 284, of which 2 177 were female (50%). In addition, about 2 400 people were employed as part-time or seasonal workers. Of these, nearly 1 730 were female, or 72% of total people employed.

The operation, inspection and control of fishery processing and handling facilities in Turkey are carried out in conformity with the directives laid down within the framework of EU regulations. Special attention is paid to comply with EC Directive 91/493 which deals with health conditions.

Trade and markets

Trade

Over the last years, both fish exports and imports have shown an increasing trend. Compared to 2005, in 2008 the volume of fish imports increased by 66% to around 63 000 mt. In value terms, total imports increased in 2008 to approximately USD 119.7 million, representing a 74% increase on 2005. The majority of imported fishery products were high value-added products (*e.g.* smoked salmon) and/or frozen fish products for human consumption and fish meal and frozen fish for use as feed in tuna ranching. Norway, Netherlands and Spain are key suppliers of fishery products to Turkey. Main import species are mackerel, sardines, herrings, anchovy, skipjack, stripe-bellied bonito species, pilchard and salmon.

In 2008, Turkey's fishery trade balance was about USD 176 million in surplus, compared with nearly USD 263.5 million in 2005. The European Union is Turkey's main export destination for fishery products. Values of exports and imports of fishery products between 2005 and 2008 are given in Table 27.3.

Table 27.3. **Export and import of fishery products, 2005-08**

	2005	2006	2007	2008
Exports (USD million)	206 039 936	233 385 315	273 077 508	383 297 348
Imports (USD million)	68 558 341	83 409 842	96 632 063	119 768 842
Trade balance	+137 481 595	+149 975 473	+176 445 445	+263 528 506

Source: Turkstat.

Among the exported fresh and chilled fish, sea bass, sea bream, anchovy, Bluefin tunas, silverside and smoked trout are the most important species. Bivalve, sea snail and molluscs are the second most important group in total exports. In volume terms main exports are directed to Italy, followed by Greece, with trade dominated by bass and sea bream. The most valuable market, however, is Japan due to the sales of Bluefin tuna. In 2007, output from farmed Bluefin tuna was around 4 000 mt, with a gross average value of TRY 25.7 million (approximately, USD 18 million). The other export destinations were Spain and France. Between 2006 and 2008, the average unit price of Bluefin tuna remained nearly the same. Almost all of Turkey's tuna production was exported to Japan.

Markets

Trends in domestic consumption

Consumption of fish in Turkey depends mainly on marine capture production, in particular anchovy, and the fish is generally consumed fresh. Per capita consumption of fish over the last years has been around 7 kg, with yearly variations in the availability of small pelagic fish. Freshwater fish is mainly sold on the local market and generally consumed close to the production site. The preference is for whole fresh fish. In some areas, consumers have a negative attitude towards frozen fish.

The domestic market for aquaculture products has largely expanded over the last years. The main species sold on the domestic market are sea bass and sea bream. In recent years, there has been a growing interest among large companies towards domestic-market-oriented products. Although exports of sea bass, sea bream and trout were about 70% of total production volume in the previous years, this ratio decreased to 40% in 2007.

Regulations

An implementing regulation has been drafted in order to further regulate marketing and to increase quality standards for fishery products. The draft regulation entitled Market Standards in Fishery and Consumer Information is expected to become effective within 2008.

An implementation regulation for the use of standard boxes in fisheries for the purposes of storage and transportation will be launched.

A communiqué on ensuring hygiene requirements on fishing vessels and at landing sites has been drafted.

Fisheries and the environment

Turkey has placed special focus on the development of environment-friendly fisheries and aquaculture. There are a number of fisheries regulations on environmental issues. Fish farms with an annual production capacity of 30 tonnes or above are subject to an Environmental Impact Assessment (EIA).

The Communiqué on the determination of the closed bay and golf areas identifies areas which are environmentally sensitive and where fish farms cannot be established. A Communiqué on monitoring of fish farms applies to farms established in the seas.

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PART III

Chapter 28

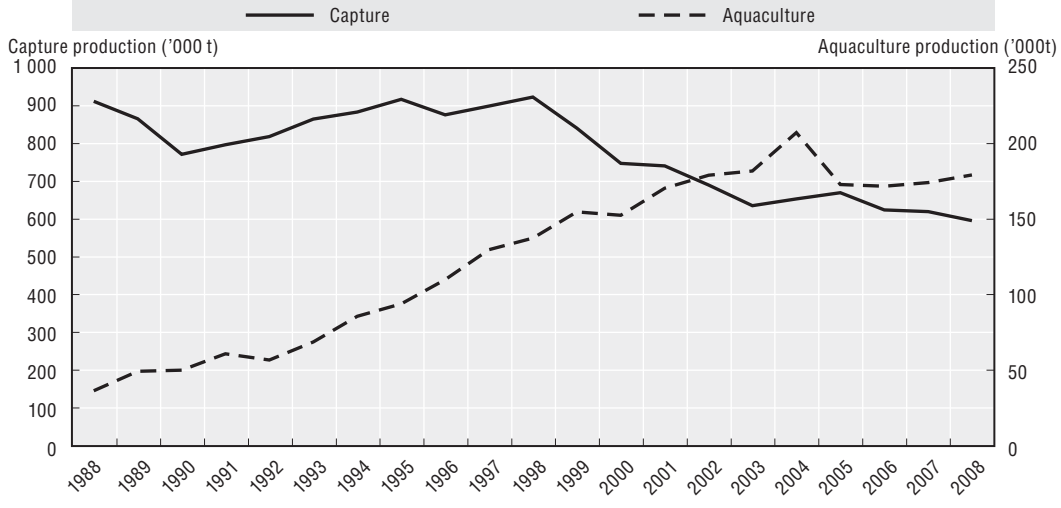
United Kingdom

United Kingdom

Summary of recent developments

- According to ICES, out of 20 fish stocks with indicators in UK waters, the proportion of stocks at full reproductive capacity and being harvested sustainably has risen from around 10% in the early 1990s to 25% in 2007. This is likely due to a combination of EU controls on total allowable catches and effort, and the decommissioning of vessels in the United Kingdom and some other countries.
- In 2008, a new Cod Recovery Plan was agreed to promote continued recovery of cod stocks in EU waters, including the North Sea. However, overall, the majority of scientifically assessed stocks continue to be fished at rates well above the levels expected to provide the highest long-term yield.
- UK fisheries policies seek to achieve a sustainable fishing sector managed effectively as an integral part of coherent policies for the marine environment. These aims have been articulated most recently in the UK response to the European Commission's White Paper on reform of the Common Fisheries Policy, most prominently:
  - economic liberalisation of EU fisheries allowing fishing businesses to operate under more normal market conditions, encouraging competition and innovation, and reducing public subsidies with appropriate safeguards to meet concerns about the impact on local fishing communities;
  - integration of fisheries policy with management of other marine activities and conservation;
  - devolved decision-making to member states with a greater say for the fishing industry and other partners in managing individual fisheries, including a move to management of shared fish stocks at regional sea level (*e.g.* North Sea) and long term management plans developed by those closest to the fishery.

Harvesting and aquaculture production (tonnes)

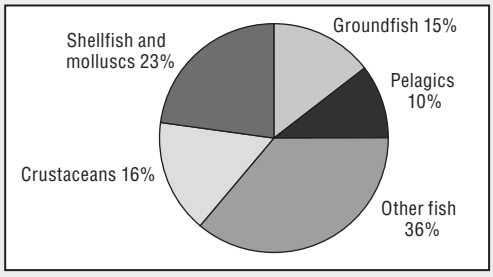


Source: FAO FishStat Database.

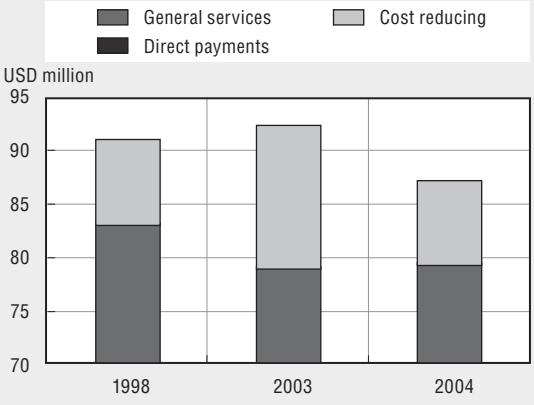
Key characteristics of the sector

- In terms of value, for flatfish, sole (1 900 tonnes in 2008) and megrim (3 400) are the two key species; for groundfish, haddock (31 900 tonnes in 2008) and monkfish (13 000 tonnes in 2008); for pelagic mackerel (90 700 tonnes in 2008) and herring (38 200 tonnes in 2008). Nephrop landings accounted for 22% of the total value of domestic landings in the United Kingdom. Crab landings totalled 24 700 tonnes in 2008 and scallops at 23 100 tonnes with a value of GBP 40.2 million.
- The European Fisheries Fund (EEF) is the main funding source for government financial transfers. EEF allocations were used to launch a vessel decommissioning scheme. Sixty-five vessels were decommissioned, removing some 457.3 gross tonnes and 5 604 kW from the fleet.
- The United Kingdom remains a net importer of fish and fish products. Total imports were 781 000 tonnes in 2008 and increased 11% in terms of value compared to 2007. Exports in 2008 totalled 416 00 tonnes, a decrease of 11% compared to 2007.
- In 2008, 12 761 people were employed in harvesting (99 more than in 2007), out of which about 80% as full-time fishers. At the end of 2008, there were 6 573 registered vessels in the UK fishing fleet (including the Isle of Man and Channel Islands), 190 fewer than at the same time in 2007. The gross tonnage of the fleet fell by just 2.5% to 207 423 tonnes in 2008. There were 5 077 vessels of 10 metres or less in length in 2008 (3% fewer than in 2007) and the number of vessels over 10 metres in length went down by 2% to 1 496.

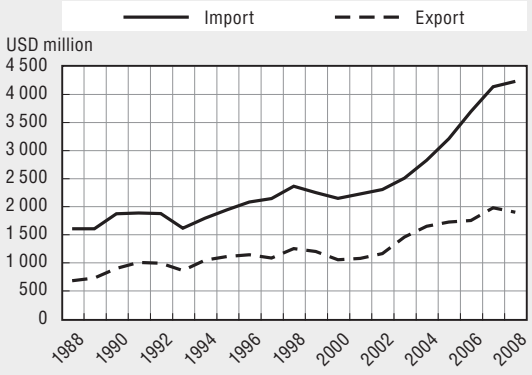
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fishers	14 894	12 761	–14.3
Number of fish farmers	n.a.	3 142	n.a.
Total number of vessels	7 681	6 577	–14.4
Total tonnage of fleets	256 924	210 158	–18.2

n.a.: not available.

Legal and institutional framework

Fisheries management in the European Union is a Community competence and as such managed through the EU Common Fisheries Policy (Council Regulation [EC] No. 2371/2002) and associated legislation. Responsibility for fisheries in the United Kingdom lies with the Secretary of State for Environment, Food and Rural Affairs, Scottish Ministers, the Minister of the Welsh Assembly Government and Northern Ireland Executive Ministers. The principal powers governing the regulation of fisheries are set out in the Sea Fish (Conservation) Acts 1967 and 1992; the Sea Fisheries Act 1968; the Fishery Limits Act 1976; the Fisheries Act 1981; the Sea Fisheries (Shellfish) Act 1967 and the Fisheries Act 1966. Responsibility for these functions in relation to Scotland, Wales and Northern Ireland were transferred to the Scottish Executive, Welsh Assembly and the Department for Agriculture and Rural Development of Northern Ireland, respectively, by virtue of the Scotland Act 1998, the Government of Wales Act 1998 and the National Assembly for Wales (Transfer of Functions) Order 1999 and the Northern Ireland Act 1998.

Any person wishing to fish under the British flag and against UK quotas may do so only with a fishing vessel, which is both registered and licensed by the UK authorities. In order to register a fishing vessel, the owners should be UK citizens, EU citizens established in the United Kingdom or companies incorporated within the European Union with a place of business in the United Kingdom. As a condition of registration all fishing vessels must be managed, controlled and directed from the United Kingdom. A restrictive licensing scheme operates and no new licences are issued by the UK authorities. Anyone who wishes to fish for profit must acquire a licence from an existing fishing vessel. Owners of all vessels fishing against the United Kingdom's quotas have to maintain a genuine economic link with the United Kingdom. This may be achieved through landing quota catches into the United Kingdom, employing crew resident in the United Kingdom or other measures sufficient to ensure that a satisfactory economic link is achieved.

In the United Kingdom over 95% of quotas in EU waters are allocated through Producer Organisations (POs) ("the sector"). The remaining quota is divided between the "non-sector" (vessels over 10 metres in overall length but not members of a PO) and the under 10 metre fleet.

Capture fisheries

The volume of total landings by UK vessels in domestic ports fell from 440 000 tonnes (live weight) in 2007 to 409 000 tonnes in 2008, and the value of landings fell by 3% from GBP 535 million in 2007 to GBP 518 million in 2008. Profitability remained poor in many sectors (particularly the white fish fleet) as a result of high fuel prices and falling quotas.

In 2008, demersal species accounted for 35% by value of all landings by the UK fleet into domestic ports, pelagic fish 16% and shellfish 50%.

Of the flatfish, sole and megrim are the two key species. Landings of sole by UK vessels into UK ports fell by 6% in 2008 to 1 900 tonnes (GBP 14.2 million). Megrim landings into the United Kingdom increased by 1% to 3 400 tonnes (GBP 9.9 million). In 2008, 2 900 tonnes of plaice were landed (GBP 3.5 million).

Of the groundfish, haddock and monkfish are the two key species. Haddock landings fell by 1% to 31 900 tonnes in 2008 (GBP 34.4 million). The quantity of monkfish landed into the United Kingdom fell by 6% to 13 000 tonnes (GBP 36.2 million). In 2008, 9 800 tonnes of cod were landed (GBP 20.3 million).

Mackerel and herring are the two key pelagic species. The quantity of mackerel landed fell by 10% in 2008 to 90 700 tonnes, 22% of all landings by the UK fleet into domestic ports. Mackerel landings were worth GBP 67.8 million. The amount of herring landed fell for the third consecutive year, down by 25% on 2007 levels to 38 200 tonnes with a value of GBP 9.4 million.

Nephrops and crabs are the two key crustacean species. Nephrop landings fell by 3% to 43 000 tonnes in 2008 with a value of GBP 114.6 million, the highest of any species and 22% of the value of all landings by the UK fleet into the United Kingdom. Crab landings fell by 14% to 24 700 tonnes (GBP 32.6 million).

Scallops are the key mollusc species and landings in 2008 increased by 11% to 23 100 tonnes, with a value of GBP 40.2 million.

The species referred to above accounted for almost three-quarters of the value of UK vessels landings in domestic ports.

Landings by UK vessels into foreign ports increased by 5% to 179 000 tonnes in 2008 with a value of GBP 111 million. Between 2007 and 2008, landings by foreign vessels into domestic ports increased by 17% to 129 000 tonnes although the value of these landings fell by 9% to GBP 78 million. The rise in quantity landed was down to a large increase in landings of low value blue whiting.

Discards

Discards, which are a feature of mixed fisheries across EU waters, are a waste of natural resources, disruptive to marine ecosystems and ethically undesirable. The United Kingdom currently does not have an economic estimate of the cost of discards; however, the waste could form a significant financial sum. Research is taking place to try and quantify the economic impacts of discarding.

Discards from the UK fleet have been decreasing year on year (since 2002). The total weight of discards in 2009 by English and Welsh vessels is estimated at 18 500 tonnes. This figure is 20% less than estimates for 2008. Discards can be reduced through a combination of measures such as developing more selective gears (*e.g.* bigger mesh sizes, escape panels in the nets), closures of nursery grounds or areas of high congregation of vulnerable or intensely exploited stocks.

The United Kingdom is also working with Denmark to reduce discards with a trial of a fully documented catch quota management system, monitored by electronic technology, including CCTV. An interim report of the project is due in autumn 2010 and will inform future work on fully documented catch quotas in 2011.

Status of fish stocks

The number of fish stocks around the United Kingdom at full reproductive capacity and harvested sustainably is used as an indicator of the state of fish stocks of interest to the United Kingdom. This sustainability indicator is based on a consistent set of 18 stocks since 1991 and on a consistent set of 17 stocks between 1982 and 1990. The 18 stocks represent a wide range of different stocks and fisheries, including demersal groundfish (cod, haddock, saithe, and hake), flatfish (sole, plaice), pelagic (mackerel, herring) and widely dispersed (blue whiting). Many of these stocks are extremely valuable or have high conservation profile. The indicator is applicable only to these stocks.

In 2008, 50% of the 18 assessed fish stocks around the United Kingdom were at full reproductive capacity and were being harvested sustainably. Since 2000, 20-40% of the fish stocks around the United Kingdom have been at full reproductive capacity and being harvested sustainably (1990-99: 5 to 15%).

The proportion of the 18 stocks being harvested sustainably has increased from around 10% in the 1990s to between 25-45% during the 2000-07 period and reached 61% in 2008. In contrast, the proportion with full reproductive capacity has increased from 35% in 1999 to 61% in 2008.

Although the proportion of stocks being harvested sustainably is increasing, fishing mortality in most of the stocks remains above values that may be considered as providing the maximum long-term yields or economic returns under the prevailing environmental conditions that affect stock productivity.

Management of commercial fisheries

During 2008 and 2009, the government continued to operate a restrictive licensing scheme in which licences were used to control the number of vessels fishing and stocks caught. Capacity reduction penalties were applied where licences were transferred or aggregated. These licence arrangements contributed to the UK's Multi-Annual Guidance Power (MAGP) objectives.

In February 2008, the Scottish Government established a Conservation Credits Scheme which rewards fishermen who sign up to measures which have an appreciable impact on the conservation of cod stocks, including a one net rule and the use of a square mesh panel and other gear changes aimed at reducing catches of cod. The scheme also expands the innovative Real Time Closures scheme on which Scotland led last autumn, protecting spawning aggregations and high concentrations of cod in the North Sea. In return for the respect of these conditions, vessels receive additional days at sea. In 2009, similar schemes aimed at rewarding cod avoidance behaviour were extended in other parts of the United Kingdom and the Real Time Closure mechanism was expanded to the southern parts of the North Sea and the West of Scotland, with all UK vessels respecting closed areas.

In 2009, the government, through the European Union, and in conjunction with Norway and the Faeroes Islands, implemented a system of Real Time Closures in the North Sea specifically aimed at protecting juvenile aggregations of cod, haddock, whiting and saithe. Where catches of juvenile fish are above defined levels, time limited closed areas are implemented and all EU, Norwegian and Faroese vessels using demersal trawl and similar gears are required to avoid the areas until reopened.

In 2010, the UK and Scottish Governments undertook trials for a fully documented catch quota system. Under the scheme fishing vessels are provided with additional quota for North Sea cod in return for recording all catches against their quota allocation. Catches are full documented using Remote Electronic Monitoring (REM) systems with CCTV. The objectives of the trails are to eliminate cod discards, allow fishermen to land more of what they catch, whilst reducing overall (*i.e.* landings and discard) mortality on the stock. Trials are ongoing throughout 2010.

The UK response to the EU CAP reform Green Paper calls for:

- *Economic liberalisation of EU fisheries* allowing fishing businesses to operate under more normal market conditions, encouraging competition and innovation, and reducing

public subsidies with appropriate safeguards to meet concerns about the impact on local fishing communities.

- *Integration of fisheries policy* with management of other marine activities and marine conservation, rather than treating fishing in isolation.
- *Devolved decision-making* to member states with a greater say for the fishing industry/other partners in managing individual fisheries, including a move to shared fish stock management at regional sea level (*e.g.* North Sea) and long term management plans developed by those closest to the fishery.
- Opportunities remain to support moves towards sustainable fisheries in advance of CFP reforms in 2013. For inshore fisheries, in particular, the question of how to extract social and environmental benefit in the context of economic liberalisation will be fundamental. Our aim is for all elements of the fleet, big and small, to be economically viable and operating without long-term subsidy. The Sustainable Access to Inshore Fisheries (SAIF) project has been looking at the current structure and management systems for the fleet, and how that might be reformed in order to secure a sustainable future for the industry as a whole. A public consultation will be issued later in 2010. The SAIF project follows measures introduced in 2008 to ensure short-term stability to the inshore fleet in England, as a first step towards a sustainable fleet in the long term. This included a new licence to fishermen not targeting quota stocks, limiting any increase of effort and safeguarding stocks and a GBP 5 million decommissioning scheme.
- The United Kingdom recognises the need to look beyond the United Kingdom and European Union to protect fishery resources and the trade in fishery products. The United Kingdom exports over 50% of domestic landings; however, over 70% of domestic fish and fish products consumed are imported, mainly from outside the European Union. New rules came into force in the United Kingdom on 1 January 2010, to combat Illegal Unreported and Unregulated (IUU) fishing. This EU-wide legislation seeks to prevent, deter and eliminate the import of IUU products into the Community.
- The Marine and Coastal Access Act became law in October 2009. This groundbreaking piece of legislation will greatly improve the way the United Kingdom uses its marine resources and maximises the benefits it gets from them. The Act introduces new systems for marine planning and licensing and sets out a flexible mechanism to protect natural resources, including a process for designating Marine Conservation Zones (MCZs) that contribute to an "ecologically coherent network" of well-managed marine protected areas while taking account of the socio-economic impact of such measures on other marine activities including fishing. The Act will provide measures for better management of fisheries, in particular through the introduction of Inshore Fisheries and Conservation Authorities which will have a duty to manage sustainably sea fisheries resources and conservation in their districts with modernised enforcement powers. A new Marine Management Organisation (MMO) has been established to act as a strategic delivery body for the marine area, including enforcement of fisheries management rules.
- A Marine Science Coordination Committee has been established to develop a UK Marine Science Strategy to help deliver the evidence to fulfil the United Kingdom's Marine Objectives. A detailed assessment of the UK seas was published in 2010. "Charting Progress 2" will provide evidence to meet the requirements of the EU Marine Strategy Framework Directive, which requires member states to achieve Good Environmental Status for their seas, including fish stocks.

- The Marine Climate Change Impacts Partnership (MCCIP) provides a co-ordinating framework for the United Kingdom, transferring high quality evidence on marine climate change impacts and related advice to policy advisors and decision-makers. Recent MCCIP reports have covered issues such as sea-level rise, sea-surface temperature and ecosystem linkages including impacts on fish stock abundance and distribution and ocean acidification. A GBP 10 million five-year research programme has been initiated to understand the impacts of climate change-induced ocean acidification, including likely effects on commercial fishing.

Regional Advisory Councils (RACs)

The 2002 reform of the CFP, as part of an overall process to increase and formalise the consultation process within EU fisheries management, established the RACs to advise the Commission on decisions concerning fisheries management in respect of certain sea areas or fish stocks. RACs are now established and operating for the Baltic Sea, North Sea, North Western Waters, South Western Waters, the High Seas/Long distance fleet, Pelagic Stocks and in the Mediterranean. The United Kingdom broadly agrees with the Commission's experience of the RACs to date and finds some of the Commission's proposals for improvement sensible.

Management of recreational fisheries

In the UK recreational fishing is defined as a not for profit fishing activity. It is illegal for a recreational fisherman to sell anything he catches. In order to do this a commercial fishing license is required. There are currently no daily catch limits for recreational fishermen in the United Kingdom, although, there is mandatory catch and release for eels.

Since 2008, rules regulating access to resources, gear restrictions or catch changed slightly:

- The introduction of mandatory catch and release for eels in rod fisheries as part of the UK's commitment under the European Eel Regulation (EC) No. 1100/2007.
- The introduction of the Marine and Coastal Access Act in 2009 lead to discussion about whether to include powers to license recreational sea anglers. This was decided against;
- the United Kingdom is preparing to meet its obligations under Article 55 of the Control Regulation. This requires Member States to set up a sampling regime to monitor the catches by recreational fishing vessels of stocks subject to recovery plans (cod, hake and certain sole and plaice stocks). Where the catches identified by this sampling regime are deemed by scientists to have a significant impact, the Control Regulation provides that the Council may introduce additional management measures to control recreational activity, including but not limited to a licensing regime and a requirement for recreational fishermen to record their catches in logbooks.

Fisheries science

UK Government funding of marine fisheries R&D was GBP 5.3 million in 2009-10 (2008-09: GBP 5.4 million) and GBP 11.2 million for scientific monitoring activities in 2009-10 (2008-09: GBP 11.4 million[1]).

Monitoring and enforcement

UK Fisheries Departments continue to give high priority to fisheries control and enforcement and in 2009 spent approximately GBP 34 million on an integrated programme of aerial, surface and port surveillance. In 2009, the United Kingdom participated in nine joint deployment plans (JDP) to ensure compliance with cod recovery measures in the North Sea, Irish Sea and Western waters. The United Kingdom also took part at a NEAFC/NAFO 21-day joint deployment plan primarily concerned with the monitoring of closed areas in the RFMOs and IUU checks to prevent movement of illegal fish. All participating Member States shared vessel monitoring system data (satellite position reports) and exchanged inspectors both in port and at sea to allow patrol vessels to work in any waters.

Aquaculture

Policy changes

Investment by public bodies in aquaculture overlaps with expenditure on fish health research to protect the environment and investment to develop the rural economy in general. Government and academic research bodies and the aquaculture sector jointly sponsor research on sustainable aquaculture development, the maintenance of high fish health and welfare status of farmed and wild fish stocks and the evaluation of alternative species for cultivation. Wild lobster populations are supported through hatcheries in Cornwall, Orkney and Shetland based round collecting gravid females from fishers.

Aquaculture production in the United Kingdom is concentrated on Atlantic salmon, rainbow trout and mollusc shellfish, such as mussels and Pacific Oysters. There is limited production of other species, such as carp, brown trout, turbot, halibut, cod and Arctic char. There is emerging interest in the use of line mussel culture in coastal waters around England and Wales, however to date only one or two operations have been established. There are also emerging species such as tilapia, barramundi, bass and sea bream. Only some new fish farms based on re-circulation have changed aquaculture technology and facilities since 1997.

The relative importance of the aquaculture sector varies around the UK. For example, nearly all of the UK farmed salmon is produced in Scotland and the majority of farmed mussels are produced in Wales. In 2008, there were approximately 400 active fish and shellfish farming businesses in the United Kingdom operating on more than 800 sites, directly employing some 1 900 people with a total industry turnover in 2008 of some GBP 600 million. Total finfish production was 144 000 tonnes in 2008, dominated by farmed salmon (129 000 tonnes) and rainbow trout (13 000 tonnes). There is limited production of other species on a niche or emerging basis, such as tilapia, sea bass, halibut, and turbot. Other species, *e.g.* various carp, are produced more for recreational (restocking) or ornamental markets. Farmed shellfish production was around 36 000 tonnes in 2008. Mussels are the largest production (80% of tonnage and 53% of value), then Pacific Oysters (12% by weight but 40% of value).

Table 28.1 summarises some information on the scale of aquaculture in the United Kingdom. More information is recorded by the UK Office for National Statistics in their business register, including details on the level of production and other key economic indicators for the aquaculture industry compared to the other fisheries sectors. The number of enterprises is smaller than the number of sites and reflects an industry that includes large international concerns down to individual artisanal and part-time activity.

Table 28.1. **The United Kingdom aquaculture sector, 2008**

	Number of aquaculture sites producing in 2008		Tonnes produced (fish and shellfish)		Number of employed (full and part time)	
	Number	%	Tonnes	%	Number	%
England and Wales	315	39	24 891	14	882	46
Scotland	394	49	144 079	80	834	44
Northern Ireland	100	12	10 872	6	160	8
Total	**809**	**100**	**179 842**	**100**	**1 900**	**100**

This is indicative of one quality issue that might be seen with the proposed work on the collection of economic data.

Dealing more particularly with England and Wales, the list of registered farms is now publicly available as "Fish Farming and Shellfish Farming Businesses Register".[2] The number of currently registered farms is 348 for finfish (235 salmonids, 113 with coarse fish), 77 shellfish production areas, and 104 importers of live (*i.e.* ornamental but not tropical aquarium) fish.

Within England and Wales the largest fish production is rainbow trout (in 2008, 4 911 tonnes for the table and 2 204 tonnes for restocking). Brown trout are also produced for table (71 tonnes) and restocking (248 tonnes). Salmon are produced in hatcheries in large numbers (18 million parr sent for on-growing and 1.45 million for restocking). Other species are produced for restocking fisheries and on small-scales for the table. Shellfish are dominated by mussels (15 000 tonnes) and cockles (2 057 tonnes). Crustaceans (shrimp) are farmed at two sites and lobsters stocks are reinforced by fishers taking gravid females to hatcheries in Cornwall (and Orkney) where the larvae are reared until released.

Farm gate value of rainbow trout was estimated at GBP 3 000/tonne, brown trout as GBP 8 200/tonne. Live fish for restocking are more valuable, for example, it is estimated that carp averages GBP 7 000/tonne but larger specimen carp will command much higher prices.

Fisheries and the environment

Since 1999, the only type of waste that is routinely considered for disposal at sea round the coast of the United Kingdom is material dredged from ports and harbours and small quantities of fish waste. Strict licensing controls operate under the Food and Environment Protection Act (FEPA). The purpose of this licensing regime is to protect the marine environment and to prevent interference with other uses of the sea (including fishing). Before issuing a licence for sea disposal, the licensing authority is required to check the practical availability of any alternative ways of dealing with the material and applicants are required to investigate the possibility of using some or all of the material beneficially (*e.g.* beach replenishment, salt marsh regeneration. Sea disposal is also considered only after a rigorous scientific assessment of the impact of the material on the marine environment.

FEPA also controls a wide range of construction works undertaken at sea. These controls are central to the application of the UK Government's policy of sustainable development in the marine sector. Schemes to offset rising sea levels and to produce renewable energy (offshore windfarms) are examples where detailed scientific evaluation is necessary to minimise any adverse environmental effects upon fisheries and indeed may even offer stock enhancement opportunities.

The discharge of radioactive waste to the marine environment is also strictly controlled by national legislation. Sites are regularly inspected and authorisations reviewed to ensure that discharges are kept as low as is reasonably achievable.

The Marine and Coastal Access Act 2009 introduced a new mechanism for designating Marine Conservation Zones (MCZs) to protect features of national importance and interest. Work is underway to create an ecologically coherent network of marine protected areas in UK waters. The network will consist of MCZs, European marine sites, sites of special scientific interest with a marine component and Ramsar sites. The network is planned to be substantially complete by the end of 2012.

Defra's delivery partners, Natural England and JNCC, have been tasked with making recommendations on where the new MCZ sites should be located. They have set up four regional projects around the English coastline to look at local and national data and to work with local stakeholders to find suitable sites. Unlike other existing Marine Protected Areas, MCZs will be taking socio-economics into consideration. The projects are due to report to the delivery partners in summer 2011, with recommendations being put to Defra Ministers in autumn 2011. This will be followed by a public consultation, with a view to introducing the sites in 2012.

To meet commitments under the Habitats and Wild Birds Directives, the United Kingdom put forward 15 new European Marine Sites (Special Areas of Conservations – SAC – and Special Protection Areas – SPA) in 2010 for designation to the European Commission. Further sites are planned to be put forward to complete the SAC network in UK waters by 2012.

There are currently 94 SACs with marine components, covering 3.4% of the UK sea area. The United Kingdom also has 107 SPAs with marine components, three of these are entirely marine: Bae Caerfyrddin/ Carmarthen Bay SPA (Wales), the Outer Thames Estuary and Liverpool Bay/Bae Lerpwl SPAs (joint England/Wales).

Under Article 6(2) of the Habitats Directive there is a commitment to protect European Marine Sites from potentially damaging activities, *e.g.* fishing. Under the regulations transposing the Directive, competent authorities are responsible for ensuring these commitments are met.

As part of the implementation of the Marine and Coastal Access Act 2009, the UK Government, Scottish Government, Welsh Assembly Government and the Northern Ireland Executive have drafted a Marine Policy Statement. This sets out the sectoral/activity policy objectives of the administrations, including those for fisheries, in order to achieve the UK's vision of clean, healthy, safe, productive and biologically diverse oceans and seas and contribute to the achievement of sustainable development. There is a public consultation on the draft Marine Policy Statement between July and October 2010 with the aim of finalising it in Spring 2011. A series of Marine Plans will then be developed to interpret and present the policies in the Marine Policy Statement at a sub-national level. Together the Marine Policy Statement and Marine Plans will create the framework for consistent, sustainable and evidence-based decision-making.

The United Kingdom decided following a consultation in July 2006 to introduce measures to protect tope, a vulnerable European continental-shelf and coastal shark species. The Tope (Prohibition of Fishing) Order 2008 (SI 2008/691) prohibits fishing for tope other than by rod and line and sets a 45 kg per day tope by-catch limit in commercial

fisheries targeting other species. Defra is currently carrying out a public consultation on the effectiveness of this measure.

The United Kingdom has ceased issuing special fishing permits to remove shark fins under Council Regulation (EC) No. 1185/2003. This means that all UK flagged fishing vessels, wherever they fish and wherever they land their catch, must ensure that all sharks retained and landed have their fins still attached to the carcass. This decision was taken in order to prevent shark carcasses being disposed of at sea and the fins retained. It will also make identification of the species more enforceable and therefore provide better scientific data on catch compositions, which will contribute towards better stock assessment and management measures.

No significant environmental issues arose in connection with aquaculture in 2006-07. The report *Scotland's Seas: Towards Understanding their State*, an assessment of the environmental impact from aquaculture concluded that overall, despite the dramatic rise in the production in the last two decades, the control measures in place by regulatory authorities address the main processes by which aquaculture may adversely affect the surrounding environment. Scotland transferred planning controls for marine fish farms in 2007 to local authorities.

The Shellfish Water Directive 2006/113/EC (codified version, which replaced 79/923/EC) was adopted by the European Parliament and the Council of the European Union in December 2006. The Directive seeks to protect or improve shellfish waters in order to support shellfish life and growth and thus contribute to the high quality of shellfish products directly edible by man.[3] The Surface Waters (Shellfish) (Classification) (Amendment) Regulations 2009 (Statutory Instruments 2009 No. 1266, Water Resources, England And Wales) transposes Directive 2006/113/EC into law. The Shellfish Water Directive is to be repealed with effect from 22 December 2013, after which it will be subsumed into the Water Framework Directive (WFD). Section 51 of the WFD requires equivalent protection for shellfish waters on repeal of the SWD.

The Marine Strategy Framework Directive, which came into force on 15 July 2008, requires all member states to achieve Good Environmental Status in their marine waters by 2020. In implementing this Directive the United Kingdom will need to consider whether additional fisheries management measures are necessary in order to deliver Good Environmental Status in UK waters.

Government financial transfers

The European Fisheries Fund (EFF) is the European Union's financial instrument for the fisheries sector. The programme for 2007-13 helps to attain the objectives of the Common Fisheries Policy. Projects co-financed by the EFF must promote sustainable fisheries and aquaculture.

The EFF is a driver of development, designed to be the financial component of the CFP. As a public support instrument, it contributes to the financing of projects initiated by businesses, public authorities or representative bodies in all the economic activities that make up the fisheries sector: catches, ports, farming, processing, marketing, heritage, etc. The EFF contributes to the overarching aim of fisheries management in the United Kingdom – fisheries industry that is sustainable, profitable, well managed, internationally competitive and helps support thriving, diverse and sustainable local communities, managed effectively as an integral part of coherent policies for the marine and freshwater environment. The fund

promotes the sustainable exploitation of fisheries resources and aims to balance the needs and capacity of the fleet with resource availability. Funds are directed to projects that increase competitiveness of the industry, promoting environmentally friendly fishing and production methods, provide adequate support to people employed in the sector; foster the sustainable development of fisheries areas and support sustainable growth and diversification in the aquaculture and fisheries processing sectors.

In 2009-10, Defra invested approximately GBP 1.6 million on 15 projects related to aquatic animal health, to assist in maintaining high fish health status of farmed and wild fish stocks.

In 2008, a vessel decommissioning scheme was launched for the English inshore fleet, part funded by EFF. This formed part of a package of measures designed to secure short term stability for the fleet, whilst long term strategies are developed to address the problem of an imbalance between fleet capacity and fishing opportunity. Sixty-five vessels were decommissioned removing some 457.3 gross tonnes and 5 604 kW from the fleet.

Post-harvesting policies and practices

The total supply of fish available for domestic use increased by 8% in 2008 to 762 000 tonnes.

Overall, the size of the UK processing industry has reduced in recent years and is characterised by a small number of large scale processors and a large number of small processors. In 2008, the number of people employed within the fish processing industry was approximately 15 000 with around 500 processing plants. A small number of large secondary and mixed processors provide a large share of the industry employment. There has been a shift in the structure of the industry with fewer processing demersal species exclusively with an increase in mixed species processing. The key processing regions in the United Kingdom are Humberside and Grampian. In addition to fish supplied by the UK fleet, imports make up a significant proportion of the raw material supplied to the industry. Important supply markets include Iceland, Norway and the Faroe Islands.

Table 28.2. **Trends in the UK fishery processing industry**

	1986	1995	2000	2004	2008
Number of UK employees	19 359.0	19 659.0	22 255.0	18 180.0	14 660.0
Number of processing plants	988.0	719.0	541.0	573.0	479.0
Average employees per plant	19.6	27.3	41.1	31.7	31.3

Source: Seafish .

Statutory labelling for example regarding food safety, nutritional information and country of origin is subject to EU and domestic legislation. Consumer interest in information on the sustainability and provenance of fish and seafood has grown in part due to increased media interest and a higher marketing profile through retailers aligned with greater prominence of on-pack sustainability marks (such as the Marine Stewardship Council's scheme) and guides on "fish to avoid". The UK fishing industry has responded through increasing numbers of fisheries seeking assessment through accreditation schemes.

Markets and trade

The National Statistics publication, *Family Food* in 2005-06 shows that UK household purchases of fish increased from 158 g per person per week in 2004-05 to 167 g per person per week in 2005-06, an increase of 5.7%. Expenditure has increased by over 5% from GBP 0.99 per person per week in 2004-05 to GBP 1.04 in 2005-06. This is accounted for a 19% rise in purchases of fresh, chilled and frozen herrings and other oily fish and a 14% rise in fresh chilled or frozen salmon. Purchased quantities of fish-based ready meals, rose by 9.6% from 45 to 49 g per person per week.[4]

Under EU support arrangements, if a member of a PO puts fish up for sale for human consumption but cannot find a buyer at or above the pre-set withdrawal price, the fish must be permanently withdrawn from the human consumption market and a claim for aid made by the PO. The Rural Payments Agency reported that from April 2009 to the end of March 2010, there were 46 fish withdrawal claims transactions paid with a value of GBP 359 092.20. The main species of fish were megrim and plaice.

Total imports of fish and fish preparations rose from 552 000 tonnes to 781 000 tonnes (an increase of 41%) between 1999 and 2008. In value terms, total imports rose in 2008 to GBP 2.2 billion, an 11% increase on 2007. In 2008, total exports of fish and fish preparations amounted to 416 000 tonnes product weight, a decrease of 11% on 2007. However, in terms of value, total exports were GBP 1 billion in 2008 compared with GBP 982 million in 2007.

Outlook

In the short term, the UK fishing industry will continue to remain under pressure due to rising costs, low returns and increasing competitive pressures.

Effective reforms of domestic, EU and international fisheries management frameworks are necessary to allow for long-term sustainable fisheries, supporting a viable fishing industry and providing secure, healthy food supplies.

Notes

1. Research vessel costs have not been included.
2. *http://euregister.efishbusiness.co.uk/annex1.aspx*.
3. Under the Directive, Member States are required to designate coastal and brackish waters, which need protection or improvement to support shellfish. Defra are currently undertaking a review of Shellfish Water Designations in England. The Welsh Assembly Government intends to review Designations in Wales in the near future.
4. Updated information is available from Seafish as of Winter 2010.

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PART III

Chapter 29

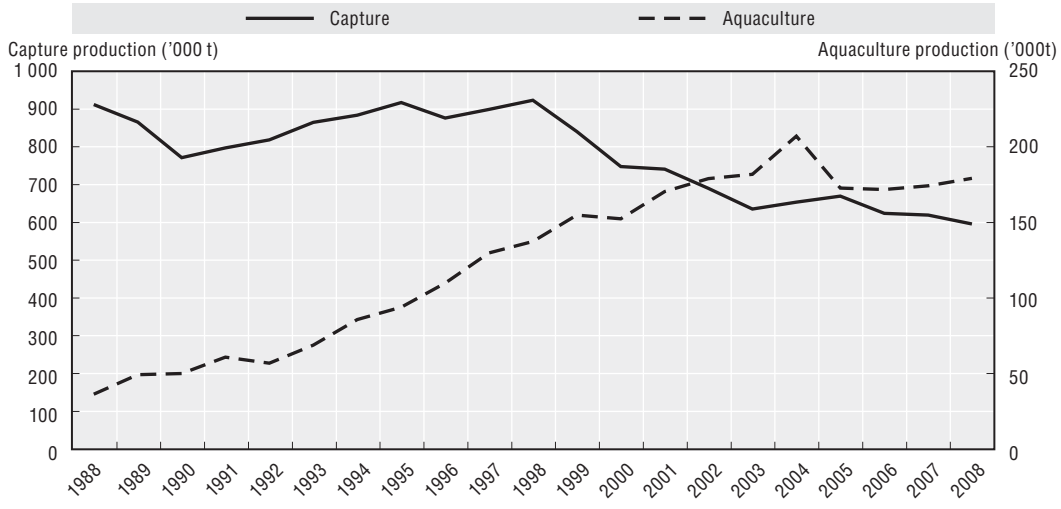
United States

United States

Summary of recent developments

- With the re-authorisation of the Magnuson-Stevens Fishery Conservation and Management Act (2007), the United States has an updated legal framework for addressing a wide variety of marine stewardship issues. The re-authorised law mandates a date-certain end to overfishing, promotes market-based management, strengthens the role of science, improves data on recreational fisheries, and includes new measures to combat illegal, unreported and unregulated (IUU) fishing and to reduce bycatch in global fisheries.
- For 2009, NOAA's National Marine Fisheries Service (NMFS) reviewed the status of 522 individual stocks and stock complexes, and determined that 15% of stocks and stock complexes with known overfishing determinations were subject to overfishing and 23% of stocks and stock complexes with known stock condition continued to be overfished. Both the overfishing and overfished rates had improved since the previous report.

Harvesting and aquaculture production (tonnes)

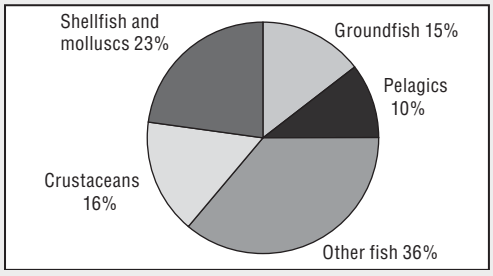


Source: FAO FishStat Database.

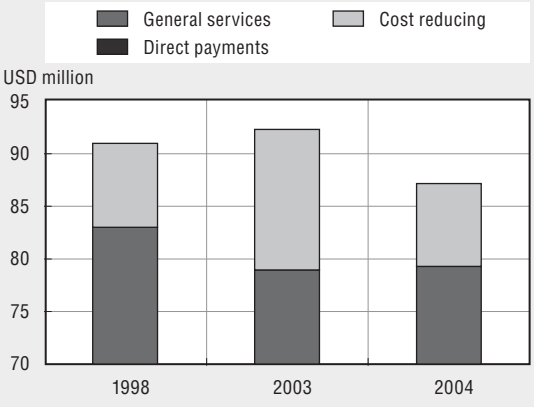
Key characteristics of the sector

- Commercial landings (edible and industrial) by US fishermen at ports totalled 3.6 million tonnes (USD 3.9 billion) in 2009. Alaskan pollock, menhaden, Pacific salmon, flatfish, cod, and crabs are the six most important species in terms of volume, while crab, shrimp, salmon, scallops, and lobster remained highest in terms of gross value. Since 2000, ex-vessel gross revenues from commercial landings has increased to USD 208 million, which represents a 5% increase in nominal terms but which adjusted for inflation likely represents a decline in revenue.
- The United States has implemented specific programmes that address some of the same objectives as structural adjustment (reduction of fishing capacity). Measures to address capacity fall in three broad categories: limited entry and other permit programmes; exclusive quota programmes, including limited access privilege programmes (LAPPs, a new term included in the reauthorised Magnuson-Stevens Act), individual fishing quotas (IFQs), community development quotas (CDQs), and co-operatives; and buybacks.
- US imports of edible fish products in 2009 were valued at USD 13.1 billion. The quantity of shrimp imported in 2009 was 1.2 billion pounds, accounting for 29% of the value of total edible imports.
- US exports were 2.5 billion pounds valued at USD 4 billion in 2009. The total value of edible and non-edible exports was USD 19.6 billion, a decrease of USD 3.7 billion compared with 2008.

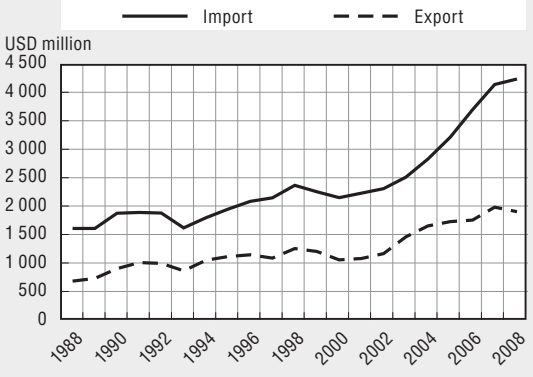
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Legal and institutional framework

The primary legal authority for fisheries management in the US Exclusive Economic Zone (EEZ) is the Magnuson-Stevens Fishery Conservation and Management Act. This statute establishes eight Regional Fishery Management Councils (Councils), which are responsible for recommending fishery conservation and management measures via fishery management plans (FMPs) to the Secretary of the US Department of Commerce for approval.[1]

The Magnuson-Stevens Act was extensively amended in October 1996 with the passage of the Sustainable Fisheries Act (SFA). Some of the key provisions of the SFA required that actions be taken to: prevent and end overfishing; rebuild overfished stocks to levels consistent with maximum sustainable yield (MSY); reduce bycatch and minimise mortality of unavoidable bycatch; designate and conserve essential fish habitat, and to the extent practicable, minimise adverse effects on such habitat caused by fishing; account for impacts of management measures on fishing communities and minimise negative impacts; and establish a fishing capacity reduction programme. In December 2006, Congress reauthorised the Magnuson-Stevens Act, placing heavy emphasis on ending overfishing, strengthening the role of science, establishing the rules for market-based management, creating a national registry of recreational fishing data and providing new tools to combat IUU fishing and the bycatch of protected marine mammals in global fisheries under legislative authority of the High Seas Driftnet Fishing Moratorium Protection Act (Moratorium Protection Act).

Under the Moratorium Protection Act, as amended by the reauthorised Magnuson-Stevens Act, the Secretary of the US Department of Commerce is required to produce a biennial report to the US Congress that lists countries the United States has identified as having vessels engaged in IUU fishing and/or bycatch of protected living marine resources (PLMRs). The Moratorium Protection Act requires the development of regulatory procedures to certify whether nations identified in the report have taken appropriate corrective action to address IUU fishing; adopted regulatory programmes for PLMRs comparable with US programmes, taking into account different conditions; and established management plans for PLMRs. The absence of steps by identified nations to address problems of IUU fishing and bycatch of PLMRs may lead to prohibitions on the importation of certain fisheries products from such nations into the United States and other measures.

The Moratorium Protection Act also calls on the United States to promote improved monitoring, control and surveillance for international fisheries; improve the effectiveness of Regional Fishery Management Organizations (RFMOs) through the adoption of IUU vessel lists, stronger port state controls and market-related measures; and build capacity in other countries to ensure sustainable fisheries and regulatory enforcement.

The National Marine Fisheries Service (NMFS) is currently developing a rule that would establish procedures for the identification of nations whose vessels are engaged in IUU fishing and/or bycatch of PLMRs, as well as procedures to certify whether sufficient action is being taken by identified nations to address these activities. The first biennial report to Congress is also being prepared. In preparation for the first identifications to be included in this report, NMFS solicited information from the public regarding nations whose vessels are engaged in IUU fishing and bycatch of PLMRs. Upon verifying this information, a list of identified nations will be developed.

In the United States, the states have the inherent power to impose restrictions necessary for the general welfare of the public, including regulations for fishing in state

waters (typically, three nautical miles from the baseline). NMFS regulates fishing in the US EEZ, which typically ranges from three to 200 nautical miles from shore. The US Fish and Wildlife Service, within the US Department of the Interior, is involved in managing fisheries on federal lands, providing technical assistance on Native American reservations, and participating in other fisheries-related activities. In addition, the Federal Government negotiates international agreements related to fisheries. There is considerable coordination between federal agencies and between federal and state agencies responsible for fisheries conservation and management. For example, under the Atlantic Striped Bass Conservation Act (ASBCA) and the Atlantic Coastal Fisheries Cooperative Management Act (ACA), NMFS develops regulations in the EEZ for species managed by the Atlantic States Marine Fisheries Commission, which comprises 15 Atlantic Coast states. Under the Anadromous Fish Conservation Act, the Secretaries of the Interior and Commerce are authorised to enter into cooperative agreements with the states and other non-federal interests for conservation, development, and enhancement of anadromous fish, including those in the Great Lakes, and to contribute funds to carry out such agreements.

Capture fisheries

Performance

Commercial landings by US fishers in the 50 states totalled 3.6 million metric tonnes valued at USD 3.9 billion in 2009, a 6% decrease in volume and a 11% increase in value, respectively, compared with 2008. Alaskan pollock, menhaden, Pacific salmon, flatfish, cod and crabs are the six most important species in terms of volume, while crab, shrimp, salmon, scallops, and lobster remained highest in terms of gross value. Since 2000, ex-vessel gross revenues from commercial landings have increased to USD 208 million, which represents a 5% increase in nominal terms.

Table 29.1. **US Commercial fishing landings, 2000-09**

	Tonnes ('000)	Pounds (million)	Revenue (USD million)
2000	4 147	9 142	3 674
2001	4 315	9 511	3 244
2002	4 277	9 430	3 194
2003	4 315	9 514	3 377
2004	4 392	9 683	3 756
2005	4 403	9 707	3 942
2006	4 301	9 483	4 024
2007	4 188	9 232	4 089
2008	3 777	8 326	4 384
2009	3 569	7 867	3 882

Commercial landings by US fishers at ports outside the 50 states along with Internal Water Processing (IWP) agreements provided an additional 390.2 million pounds (176 976 tonnes) valued at USD 171.3 million. This was an increase of 55%, or 139.1 million pounds (63 090 tonnes) in quantity and USD 81.4 million (91%) in value compared with 2008. Most of these landings consisted of tuna landed in American Samoa and other foreign ports.

At-sea processed fishery products (Pacific groundfish that are processed at-sea aboard US vessels), on a round (live) weight basis, exceeded 1 million tonnes in 2009 and comprised nearly 30% of the total domestic landings. Comprehensive information on

landing port or percentage of catch transferred to transport ships for delivery to foreign ports is unavailable, although Dutch Harbor, Alaska, is the primary port for groundfish harvested in the Bering Sea.

Estimates based on US Coast Guard and NMFS federal permit databases identify a stable number of 25 000 to 27 000 commercial fishing vessels licensed to operate in the US EEZ in recent years. NMFS is currently developing a national permit database that will enable the agency to readily quantify the total number of federally permitted craft.

In 2009, there were 60 690 workers employed in 3 200 wholesale and processing plants. Processors employed 37 397 workers at 858 plants while wholesalers employed 23 293 workers at 2 342 plants. In 2007, the commercial marine fishing industry contributed USD 38.4 billion (in value added) to the US Gross National Product. However, the evidence suggests that overall economic performance of the fleet has been below optimum level for many years (although performance varies substantially between fisheries). In a 2008 congressionally mandated report, NMFS acknowledged that high levels of excess harvesting capacity were found in one-third to one-half of the assessed federally managed fisheries and fleet sectors, likely contributing to poor economic profitability.[2]

The MSMFCA, as amended by the Sustainable Fisheries Act of 1996, requires that the Secretary of Commerce reports annually to Congress and the Regional Fishery Management Councils on the status of US fisheries.[3] Status determinations are generally made during a formal review of a scientific stock assessment using the best available scientific information. The Councils are required to develop programmes to end overfishing and rebuild overfished stocks and to prevent overfishing from occurring for the stocks approaching an overfished condition, generally in a time period not to exceed ten years. In this context, "overfished" refers to the state of the stock, while "overfishing" refers to the fishing pressure on the stock.

NMFS continues to increase the number of assessed stocks and stock complexes. In 2009, NMFS reviewed status determinations for 522 individual stocks and stock complexes, and made "overfishing" and "overfished" determinations for 193 stocks and stock complexes. This latest review shows that 15% of stocks/stock complexes with known overfishing determinations continue to be subject to overfishing, while 23% with known overfished determinations are still overfished. Both of these rates represent modest reductions from the previous report, and, as a result, NMFS can report that the national fisheries management programme is moving in the right direction.

NMFS introduced the fish stock sustainability index (FSSI) in 2005. The FSSI is a performance measure for the sustainability of 230 US fish stocks selected for their importance to commercial and recreational fisheries. The FSSI will increase as overfishing is ended and stocks rebuild to MSY levels. The FSSI is calculated by assigning a score for each fish stock based on the five criteria.

Table 29.2. **The fish stock sustainability index**

Criteria	Points awarded
"Overfished" status is known	0.5
"Overfishing" status is known	0.5
Overfishing is not occurring	1.0
Biomass is above "overfished" level	1.0
Biomass is at or above level that produces MSY	1.0

The maximum score each stock may receive is 4. The value of the FSSI is the sum of all 230 individual stock scores. The maximum total FSSI score is 920, achieved if all 230 stocks were to each receive a score of 4. The most recent FSSI score – for the first quarter of 2010 – is 571.5 (quarterly update: *www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm#07*). This total score has been increasing steadily since the FSSI rating system was adopted.

Management of commercial fisheries

The United States management instruments include total allowable catch (TAC) levels, gear and vessel restrictions, seasonal and area closures, restrictions on size/weight and individual fishery quotas. The majority of US fisheries are managed under limited entry or regulated open access programmes using a variety of these tools to manage catch, but a growing number of federally managed fisheries employ some form of exclusive harvest quotas, including individual fishing quotas, fishing cooperatives and community quotas.

United States federal fisheries management has demonstrated on a selective and case-by-case basis a willingness to devolve management authority to local (state) government and to user groups. An example of devolution from federal to state authorities is West Coast Dungeness crab, which has been turned over to the states of California, Oregon and Washington under section 306 of the reauthorised Magnuson-Stevens Act. In addition, the growing interest in fishing cooperatives and sector allocations can be viewed as examples of devolution, since, in both cases, the user group would exercise certain authorities that otherwise would be provided for in a federally approved fishery management plan. Fishing co-operatives exist in several Alaska and Pacific Northwest fisheries and sector allocation programmes have been implemented in the Northeast Multispecies fishery management plan.

To ensure that federal fisheries management prevents and ends overfishing, the latest comprehensive reauthorisation of the Magnuson-Stevens Act, signed into law on 12 January 2007, introduced two new mandates: annual catch limits (ACL) and accountability measures (AM). ACLs must be set at a level that overfishing does not occur in the fishery and must be in place by 2010 in fisheries subject to overfishing and by 2011 in all other federally managed fisheries. ACLs will be enforced by AMs, which may be in-season actions or "payback" measures taken in the following year. NMFS conferred extensively with the Councils and stakeholders on the specifics of ACLs and AMs and issued a final rule to provide detailed guidance on their implementation in January 2009.

Foreign investments in US fishing vessels and the companies that own them are regulated by flagging, ownership and cabotage requirements that were amended in the American Fisheries Act of 1998. Generally, fishing vessels operating in waters under US jurisdiction must have a US Coast Guard certificate of documentation with a fishery endorsement, be built in the United States and are subject to a 75% US ownership requirement. However, there are some exceptions to these rules for specific fisheries. Foreign ownership of quota shares in three current ITQ fisheries is prohibited under the FMPs. Foreign investments in other sectors of US domestic fisheries (*e.g.* processing, trading, marketing, and aquaculture) are not currently subject to analogous restrictions.

No major changes have occurred during the review period with respect to foreign access arrangements to US fishery resources or US access to fisheries outside the US EEZ. Only one Governing International Fishery Agreement (GIFA) is in force (Russia). Historically, small quantities of Atlantic herring and Atlantic mackerel were available for joint venture

operations in US waters (*i.e.* operations in which US-flag vessels harvest fish specified as available for joint ventures and sell their catches over-the-side for processing by authorised foreign vessels). However, no species were available for joint ventures processing in 2008 or 2009. No US fishers have operated outside US waters under this specific type of bilateral fisheries access arrangement for a decade.

The United States and Canada also have a treaty establishing a reciprocal access regime for vessels fishing for albacore tuna in coastal waters. The *Treaty Between the Government of the United States of America and the Government of Canada on Pacific Coast Albacore Tuna Vessels and Port Privileges* entered into force in 1982, with substantial amendments to the Treaty and its annexes occurring in 2002 and 2008. The current regimes, which cover the 2009, 2010, and 2011 albacore fishing seasons, limit the number of Canadian vessels allowed to fish for albacore tuna in the US EEZ to 110 per year. The number of US boats fishing in Canadian waters is to be limited to a level reflective of historic levels. The Treaty also allows boats access to the ports of the other country to land, tranship or sell their catches.

US access to foreign fisheries also occurs via the provisions of the 1987 Multilateral Treaty on Fisheries between the Governments of certain Pacific Island States and the Government of the United States of America (also known as the South Pacific Tuna Treaty). Under the terms of the Treaty, US-flagged tuna purse seine vessels have access to fisheries in the waters of the 16 Pacific Island nations that make up the Forum Fisheries Agency (FFA). The US tuna industry currently pays USD 3 million in annual access fees for up to 40 licenses, with an additional five licenses for joint ventures. Under an economic assistance agreement associated with the South Pacific Tuna Treaty, the US Government annually provides USD 18 million in economic support to the Pacific Island Parties. In recent years, the number of US vessels licensed under the Treaty has fluctuated, reaching a low of 11 vessels operating in the central and western Pacific in 2006. Since 2007, however, this trend has been reversed through a concerted effort by the US industry to revitalise the US fleet. As a result, 36 vessels are licensed to fish during the current 2010-11 licensing period. The US industry is expected to use all or close to all the available licenses within the next two years.

The commercial fishing industry (harvesters, seafood processors and dealers, seafood wholesalers and seafood retailers) generated USD 104 billion in sales, USD 45 billion in income and supported 1.5 million jobs in 2008, the most recent year included in the report, *Fisheries Economics of the United States, 2008,* which covers 1997 to 2008.

Fisheries Economics of the United States, 2008 also includes descriptive statistics on commercial fish landings, revenue and price trends; recreational fishing effort, catch and participation rates; and employer and non-employer establishments, annual payroll and annual receipt information for fishing-related industries such as seafood retailers and ship and boat building.[4]

Management of recreational fisheries

Recreational fishing in the US EEZ is defined by the Sustainable Fisheries Act (SFA) of 1996 as "fishing for sport or pleasure." Federal regulations do not provide for the sale of recreationally caught fish. However, each state sets regulations for its waters and, in a few cases, state regulations allow for the sale or barter of recreationally caught fish. With the exception of highly migratory species, recreational fishing regulations are, in most cases,

set by each state. For species under federal regulation, state and federal governments work together to develop appropriate regulations. The reauthorised Magnuson-Stevens Act requires NOAA to establish a "national saltwater angler registry" to account for all fishing occurring in federal waters or anywhere for anadromous species (into effect 1 January 2009). With the information from this registry, NMFS will be in a far better position to take into account the impacts of management measures on recreational fisheries. Many states require a saltwater fishing license and these states would likely be exempted from the federal registration requirement. Daily recreational catch limits vary by state and species – from zero for some depleted species to unlimited amounts for other more abundant species. Size limits and gear restrictions are also applied in some fisheries.

In 2009, nearly 10 million people made more than 75 million marine recreational fishing trips to the Atlantic, Gulf, and Pacific coasts. The estimated total marine recreational catch was 391 million fish. These figures represent a 17% decrease in the number of fishing trips and a 16% decline in the total catch over 2008.[5] Nearly 56% of the marine recreational catch was released live.

In 2008, the most recent year for which economic data is available, there were approximately 12 million recreational anglers across the US who took 85 million saltwater fishing trips. These anglers spent USD 4.9 billion on fishing trips and USD 18 billion on durable fishing-related equipment. These expenditures contributed USD 59 billion in sales impacts to the US economy and supported 384 000 full and part-time jobs.

The top five coastal recreational fishing states in terms of trip and durable goods expenditures in 2008 were: Florida (USD 11.1 billion), Texas (USD 2.6 billion), California (USD 1.4 billion), Louisiana (USD 2.7 billion), and North Carolina (USD 1.8 billion).[6]

Fishery rights of federally recognised tribes

The US government has a trust responsibility to federally recognised entities, including tribes, nations, villages, pueblos, etc. These entities are tribal governments, exercising a measure of governmental authority over their membership and territory. Special arrangements and provisions relating to fishing rights arise from various treaties, statutes and court rulings. As an example, federally recognised tribes on the Pacific Coast generally are treated as co-managers of fisheries resources. The Magnuson-Stevens Act grants them a seat on the Pacific Fishery Management Council, which develops conservation and management measures for federal fisheries off the coasts of California, Oregon, and Washington. As another example, in Alaska, the Western Alaska Community Development Quota (CDQ) Programme provides a unique harvesting privilege to 65 rural communities (of which indigenous people comprise 79% of the population) on the Bering Sea coast of Alaska. The CDQ Programme currently allocates a portion of the annual quota of several species, with an estimated value of about USD 55 million per year, to six non-profit corporations that represent the eligible western Alaska communities. Native people in Hawaii and the Western Pacific region are not federally recognised governmental entities. However, the Magnuson-Stevens Act authorises a Western Pacific Community Development Programme and Western Pacific Community Demonstration Project Programme to provide access to fisheries for these groups and to promote traditional indigenous fishing practices. In addition, both the Endangered Species Act and Marine Mammal Protection Act expressly provide for Native Alaskan subsistence activities.

Monitoring and enforcement

NOAA Fisheries Office of Law Enforcement (OLE) is responsible for the enforcement of more than 35 federal statutes. OLE's jurisdiction spans more than 3 million square miles of open ocean, more than 85 000 miles of US coastline, the country's 13 National Marine Sanctuaries and its Marine National Monuments. OLE is also responsible for enforcing US treaties and international law governing the high seas and international trade. OLE works closely with the US Coast Guard and the State enforcement partners to monitor fishing activities within the US EEZ using sea and air patrols, vessel monitoring systems, and other surveillance tools. The US Coast Guard (USCG), under the Department of Homeland Security, is charged with the primary responsibility for the at-sea enforcement of the nation's marine resource laws, while OLE is primarily focused on dockside enforcement and investigations of both criminal and civil violations.

As a major market state, importing over 80% of its seafood annually, the United States has an obligation to avoid the importation of illegal seafood product. Many of the fisheries products with the highest value, and thus most likely to be harvested and traded illegally, such as Bluefin tuna, Patagonian toothfish, and bigeye tuna, are controlled via international catch documentation schemes, which NOAA implements and enforces. These catch documentation schemes monitor international trade, identify the origin of imports and determine if the imports were caught in a manner consistent with relevant international conservation measures. Further, NOAA is working to integrate its trade monitoring programmes into the International Trade Data System (ITDS), which is a government-wide system, maintained by Customs and Border Protection, for the electronic collection, use, and dissemination of trade data necessary for federal agencies to perform their missions.

Ongoing investigative work has revealed the existence of complex schemes to harvest, process, sell, import, and export fish and seafood products illegally. There has also been a significant increase in the identification of ongoing international violations as revealed by investigations that have identified numerous multinational/international schemes to smuggle both wild-caught and aquaculture seafood products into the United States.

Results from recent NOAA OLE investigations provide a glimpse into the international trafficking of illegally harvested and/or imported fisheries related products:

- A Chicago based food company was sentenced 11 March 2008 to pay USD 60 000 for its role in purchasing and re-selling falsely labelled frozen fish filets from Viet Nam. The corporation further forfeited USD 197 930, the purchase value of the illegally imported fish.
- A Florida individual pleaded guilty in connection with his involvement in the illegal importation of over 11 000 pounds of yellowfin tuna from Trinidad and Tobago in violations of the laws, treaties and regulations of the United States. Previous charges also included conspiracy to smuggle large quantities of queen conch from the Caribbean to Canada and the United States.
- A Florida company was ordered to pay restitution of USD 1.13 million and sentenced to five years probation, and its president was sentenced to 51 months imprisonment for conspiring with Vietnamese exporters to intentionally mislabel hundreds of thousands of pounds of Vietnamese catfish subsequently imported into the United States.
- Canadian and US law enforcement personnel broke up a major endangered species smuggling ring and seized over 27 tonnes of smuggled queen conch meat in the United States and Canada. The internationally endangered species was being smuggled from several South American and Caribbean countries into the United States and Canada.

OLE, in collaboration with partners including the International Monitoring, Control and Surveillance Network, is actively engaged in capacity building efforts to bolster the ability of developing nations to combat IUU fishing and meet their international obligations with respect to fisheries enforcement. In 2001, the United States joined other countries to establish a mechanism for fisheries law enforcement professionals to share information and experiences as they monitor the increasingly complex harvesting and marketing of fish around the world. NOAA has served as the host for the Network since its inception. NOAA is working closely with other Network partners to coordinate the Third International Monitoring, Control, and Surveillance Network workshop in Mozambique in 2010. Successful workshops were held in Malaysia in 2005 and Norway in 2008.

Multilateral, regional and bilateral agreements and arrangements

NMFS and its partner agencies within the Federal Government work with a variety of domestic and international partners to promote ecosystem-based fisheries management, control fishing capacity, combat IUU fishing, strengthen regional fisheries management organisations, secure equitable access for US fishers to shared living marine resources, reduce bycatch, increase assistance to developing states, and ensure food security. To achieve these goals the United States participates in regional fisheries management organisations (RFMOs), multilateral and bilateral environmental agreements/fora, and free trade negotiations. In addition, the United States conducts workshops on living marine resource conservation, management, and enforcement issues and builds partnerships to improve marine conservation.

Over the reporting period, the United States participated in the multilateral negotiation to establish the Convention on the Conservation and Management of High Seas Fishery Resources in the South Pacific Ocean, which was adopted in November 2009.

In 2003, negotiations were concluded on the "Antigua Convention" to revise and update the 1949 Convention establishing the Inter-American Tropical Tuna Commission (IATTC). The Antigua Convention will come into force on 27 August 2010. This new text ensures that the convention is current with respect to internationally accepted laws on the conservation and management of oceanic resources, including a mandate to take a more ecosystem-based approach to management.

In 2008 and 2009, the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC) adopted conservation and management measures for yellowfin and bigeye tuna, pacific Bluefin tuna, swordfish, and sea turtles.

The United States chaired and participated in the International Convention for the Conservation of Atlantic Tunas (ICCAT) Future of ICCAT Working Group. Discussions on the possibility of updating the convention are ongoing. In addition, the United States chaired the Compliance Committee which is working to ensure stricter compliance with management recommendations.

The European Community organised and hosted the Second Joint Meeting of Tuna RFMOs from 29 June to 3 July 2009 in San Sebastian, Spain. Participants developed and adopted by consensus a Course of Actions. The Course of Actions includes a number of recommendations to the RFMOs for immediate action, as well as a work plan for 2009-11. The work plan called for four intersessional Workshops to be held – a Workshop on RFMO Management of Tuna Fisheries (hosted by the Forum Fisheries Agency); a Workshop on

Improvement and Harmonisation of Monitoring and Control Measures (hosted by Japan); a Workshop on Issues Relating to By-Catch (hosted by the United States); and a Workshop on the scientific process in the RFMOs. These workshops were held in June and July 2010 and recommendations developed at these workshops were forwarded to the tuna RFMOs for consideration. The United States will host the Third Joint Meeting of Tuna RFMOs in La Jolla, California in July 2011.

In May 2010, the United States chaired and participated in the resumed UN Fish Stock Agreement (UNFSA) Review Conference, where delegates reaffirmed the principles of UNFSA and promoted ecosystem and precautionary approaches in the management of the highly migratory fish stocks and straddling stocks. The Conference adopted recommendations regarding the conservation and management of stocks; mechanisms for international cooperation; non-members; monitoring, control and surveillance; compliance and enforcement; and developing states.

Aquaculture

The National Oceanic and Atmospheric Administration (NOAA) is developing a new aquaculture policy that will address all forms of marine aquaculture. NOAA announced its intent to develop the policy in September 2009 and that process is ongoing in 2010. Aquaculture development is also being considered in the context of broader Administration initiatives relating to coastal and marine spatial planning and overall US ocean policy. Priority initiatives such as an alternate feeds initiative with the US Department of Agriculture are continuing during these policy reviews.

Estimated production data is not yet available for 2008. 2007 figures show a 12 000 tonnes increase in production and a USD 30 000 decrease in value from 2006 (Table 29.3). According to the US Department of Agriculture National Agricultural Statistics Service, there were 4 309 farms in 2005 – an increase of 281 farms since the first national census of aquaculture (1998), which reported 4 028 farms.

Table 29.3. **Estimated US aquaculture production, 1997-2007**

	Tonnes ('000)	Value ('000 USD)
1997	348	910
1998	358	939
1999	382	987
2000	373	973
2001	371	935
2002	393	882
2003	422	972
2004	408	1 068
2005	376	1 118
2006	362	1 234
2007	374	1 204

Source: NMFS, *Fisheries of the United States.*

Fisheries and the environment

Protection or management of living marine resources is derived primarily from three federal statutes: the reauthorised Magnuson-Stevens Fishery Conservation and Management Act, the Endangered Species Act (ESA), and the Marine Mammal Protection Act (MMPA). It is the policy of the US Department of Commerce to apply the requirements

of the National Environmental Policy Act (NEPA) to any conservation or management actions NMFS conducts under these three statutes. NEPA provides a mechanism under which the requirements of these three conservation statutes, and others as appropriate, are integrated into the federal decision-making process. All four statutes contain substantial opportunity for public review and comment before the agencies complete final actions, except in cases where short-term emergency protections are required**.** To improve the quality and timeliness of NEPA assessments of commercial fisheries plans, section 304 of the reauthorised Magnuson-Stevens Act calls for revising and updating NMFS procedures for compliance with NEPA.

Government financial transfers

The United States continues to address impacts on fishing communities in various ways. One example is National Standard 8 under the Magnuson-Stevens Act, which states that "conservation and management measures shall take into account the importance of fishery resources to fishing communities in order to *a)* provide for the sustained participation of such communities; and *b)* to the extent practicable, minimise adverse economic impacts on such communities." Under this standard, NMFS is defining fishing communities and profiling these communities to enable improved social impact analyses for all federally managed fisheries.

Disaster assistance, under provisions in the Interjurisdictional Fisheries Act (IFA) and the MSFMCA, provides another example of social assistance. The IFA provides that the Department of Commerce can provide disaster assistance to states determined by the Secretary of Commerce to have been affected by a commercial fishery failure or serious disruption affecting future production due to a fishery resource disaster (*e.g.* from either natural or undetermined causes). Funds as appropriated may be used for any purpose the Secretary determines appropriate to restore an affected fishery or to prevent future failures. In addition, the IFA enables the Secretary to provide assistance to persons engaged in commercial fisheries, for measures to alleviate harm incurred as a direct result of a fishery resource disaster.

In addition, some individual states have social assistance programmes. For example, the Fishermen's Fund programme in Alaska provides for the treatment and care of Alaskan licensed commercial fishermen who have been injured while fishing onshore or offshore in Alaska. Benefits from the Fund are financed from revenue received from each resident and non-resident commercial fisherman's license and permit fee.

The United States does not have a statutory structural adjustment programme *per se*, but has implemented specific programmes that address some of the same objectives as structural adjustment (reduction of fishing capacity). Measures to address capacity fall in three broad categories: *i)* limited entry and other permit programmes; *ii)* exclusive quota programmes, including limited access privilege programmes (LAPPs, a new term included in the reauthorised Magnuson-Stevens Act), individual fishing quotas (IFQs), community development quotas (CDQs), and co-operatives; and *iii)* buybacks.

NMFS has the authority, under the Magnuson-Stevens Act, to conduct a fishing capacity reduction programme if necessary to prevent or end overfishing, rebuild stocks of fish, or achieve measurable and significant improvements in the conservation and management of the fishery. The Act, allows NMFS to obtain funding from public, private, industry, and/or non-profit sources. Assistance may not be provided for a fishing capacity

reduction programme unless adequate conservation and management measures are in place for that fishery. From 1994 to 2007, the United States implemented ten permit and vessel buybacks with total costs slightly less than USD 313 million, the largest of which occurred in the Bering Sea and Aleutian Islands (BSAI) non-pollock groundfish fishery, Pacific groundfish fishery, and the BSAI crab fishery. With the exception of the BSAI crab fishery, all vessel/permit buybacks to date have involved some public funding. Aggregate public costs have amounted to almost USD 70 million, or approximately 22% of total buyback costs.

Use of exclusive quota programmes and cooperatives to rationalise fisheries is also increasing. Under LAPPs and IFQ regimes, major reductions in capacity have occurred in the BSAI crab, surf clam/ocean quahog, South Atlantic wreckfish, and Alaska halibut/sablefish fisheries. LAPPs and IFQ programmes have recently been approved for the Gulf of Mexico red snapper fishery, and a pilot programme was implemented for the Central Gulf of Alaska rockfish fishery. In addition, harvest cooperatives were established in two federally managed fisheries starting in the mid- and late-1990s (Pacific Coast whiting and Bering Sea Pollock) resulting in rationalised harvesting operations and reduction in overcapacity or transfer of some overcapacity to other fisheries. A new cooperative was recently implemented in the BSAI Groundfish (non-pollock) fishery.

During the 2008-10 reporting period, the trend toward increased use of exclusive access continued, as federal fisheries management continued to steadily move away from the traditional regulated open access and other limited access approaches. In 2006, the Administration included in its Ocean Action Plan an emphasis on increasing the use of market-based approaches to fisheries management. NOAA's Fisheries Service works towards its goal of doubling the number of LAPPs (from 8 to 16) by 2011.

At the end of FY 2010 Quarter 3, the United States has 13 LAPPs in operation. There is one LAPP being implemented, the Pacific Coast Groundfish Trawl Rationalisation programme. In the North Pacific, the American Fisheries Act (AFA) Pollock Salmon Bycatch Programme is being implemented in the existing AFA Pollock LAPP fishery and the Halibut Guided Sportfish (Charter) programme is being implemented as a catch share programme in the Halibut fishery. Due to these two programmes not being developed as LAPP programmes, they are not being counted toward the LAPP Goal. There are no additional LAPPs expected to go operational during the remainder of FY 2010. The South Atlantic Council has recommended two new LAPP programmes for development: South Atlantic Snapper Grouper and South Atlantic Red Snapper. The timing of these two amendments is currently not known.

Post-harvesting policies and practices

Seafood inspection in the United States is handled by an extensive framework of federal and state agencies. The Food and Drug Administration, under the Department of Health and Human Services, has the primary authority and responsibility under the Food, Drug and Cosmetic Act for the safety, wholesomeness and proper labelling of the seafood supply in the United States. The US Department of Commerce, through NMFS, operates a fee-for-service Federal Seafood Inspection Programme (described in the Agricultural Marketing Act as amended), which provides inspection and certification services to requesting parties also with regard to food safety, wholesomeness, and proper labelling with additional effort on food quality concerns. Both agencies have the authority to provide export certification of US seafood. Seafood imports are primarily under the jurisdiction of the Food and Drug Administration.

Table 29.4. **US Government financial transfers, marine fisheries, 2005-07 (USD million)**

	2005	2006	2007
Revenue enhancing transfers (from consumers): Market price support (1)	*68.9*		
Transfer effects of US tariffs on fishery imports	68.9	66.7	68.2
Revenue enhancing transfers (from Government budgets): Direct payments (2)	*23.7*		
Promote and develop fisheries fund[1]	12.0	6.5	6.7
USDA Surplus Commodity Removal[2]	11.7	2.2	0.0
Payments for the permanent withdrawal of fishing vessels[3]	0.0	0.0	0.0
Fisheries Disaster Relief[4]	0.0	188.0	170.4
Total direct payment revenue enhancing transfers (3) = (1) + (2)	*92.6*		
Cost reducing transfers (4)	2.3		
NMFS Finance Programme[5]	0.0	0.0	0.0
Capital Construction Fund[6]	2.5	2.2	2.2
NMFS Fishermen's Contingency Fund	0.2	0.2	0.2
Economic development assistance to FFA members		18.0	18.0
Total revenue enhancing and cost reducing transfers (5) = (3) + (4)	*94.9*		
General services transfers[7] (6)	*1 137.4*		
Fisheries research and Mgt services[8]	*297.9*	*281.2*	*300.2*
Protected resources research and Mgt services	*175.5*	*145.0*	*141.0*
Habitat conservation	*53.2*	*46.6*	*43.5*
Sustainable Habitat Mgt	33.3	21.8	19.8
Fisheries Habitat Restoration	19.9	24.8	23.7
Enforcement and surveillance	*858.4*	*1 026.0*	*1 039.0*
Dept. of Homeland Security/Domestic Coast Guard Fisheries Law Enforcement[8a]	814.8	953.4	961.5
NMFS enforcement and observers	26.8	56.9	60.1
NMFS Co-operative Enforcement Programmes	16.8	15.8	17.5
Sea Grant College Programme[9] (fisheries projects)	6.7	5.5	3.8
Sea Grant College Programme (aquaculture projects)	4.3	2.1	1.0
Saltonstall-Kennedy Development Grants[10]	12.2	0.2	201.0
Fisheries infrastructure[11]	n.a.	n.a.	n.a.
Expenditures of State Fisheries Agencies[12]	n.a.	n.a.	n.a.
Aquaculture[13]		*5.2*	*6.8*
National Marine Fisheries Service (NMFS + OAR)	*9.2*	*5.2*	*6.8*
Total GFTs (7) = (5) + (6)	*1 232.3*		
Total ex-vessel fisheries revenues **(8)**	3 932.1		
Transfers/total revenues (%) **(9) = (7)/(8) x 100**	31.3%		
Revenue Enhancing and Cost reducing transfers/total revenues (%) **(11) = (5)/(8) x 100**	2.4%		
General services transfers/total revenues (%) (**6)/(8) x 100**	28.9		

NLA refers to subcategories that no longer exist in the new budget structure.
n.a. refers to numbers that were not available or could not be obtained for reasons detailed below.

1. These figures represent total US tariff revenues for imports of edible fish and shellfish products. Since most fishery imports are duty-free, the majority of these amounts are accounted for by imports of a handful of processed products such as canned tuna, sardines and oysters, smoked salmon, and frozen crabmeat.
2. The USDA market access programme as relates to marine capture fisheries provides funding to the Alaska Seafood Marketing Institute with some small amounts going to the Quality Samples Programme budget (average: USD 37 k per annum). The funding cycles reflected in the 2006 and 2007 numbers are however for 18-month periods and are not on a calendar year basis. The figures for each year are therefore inflated by approximately 33%.
3. During the review period, USDA purchased 97 600 cases (2.1 million lbs) of pink salmon at a cost of USD 2.2 million in May 2006. No surplus removal purchases were made for fish products during FY 2007.
4. This category covers, *inter alia*, assistance to address impacts of US management mandates and capacity reduction schemes. The Bering Sea/Aleutian Islands Crab Buy Back took place in 2005 and the Bering Sea/Aleutian Island Non-Pollock Ground Fish in 2007, with no government transfer. The entire amount, of these loans, are being repaid from future landings fees, including loan interest at a market rate There was no activity in 2007. Other agencies have contributed to the Gulf Coast Disaster Relief.
5. Fisheries Disaster Relief includes USD 188 M appropriated for Hurricanes Katrina + Rita plus USD 170.4 M appropriated for West Coast Salmon.
6. The Fisheries Finance Programme (FFP) provides direct loans to industry for various purposes (some repair and maintenance of fishing vessels; aquaculture; buybacks; and purchase of IFQ shares in the halibut and sablefish fisheries). It is important to note, that due to the relatively high interest rates charged on these loans and the relatively low default rate, FFP is a self-financing programme. In other words, the programme historically has not resulted in a net outflow of government funds.

Table 29.4. **US Government financial transfers, marine fisheries, 2005-07 (USD million)** *(cont.)*

	2005	2006	2007

7. The figures given for the CCF tax deferral programme represent an estimate of the economic impact on the industry of deferring these taxes. Annual deferred taxes are for the most part recaptured at a later date through lower depreciation allowances. The effective transfer to industry in the form of lower taxes has been calculated at about USD 2.2 million based on a 6.25% estimate.
8. A new budget structure for the National Oceanic and Atmospheric Administration became effective in FY 2002 and again in 2005.

8a. **New footnote 8a for economic development assistance line:** Under an economic assistance agreement associated with the South Pacific Tuna Treaty, the US Government annually provides USD 18 million in economic support funds to the Pacific Island Parties.

9. This number includes funds provided via the Mitchell Act (16 USC 755-757; 52 Stat. 345) which authorises the Secretary of Commerce to carry on activities for the conservation of fishery resources in the Columbia River Basin. The Mitchell Act specifically directs establishment of salmon hatcheries, the conduct of engineering and biological surveys and experiments, and the installation of fish protective devices. The major objective of this programme has traditionally been to mitigate the negative effects of lost salmon habitat caused primarily by the building of dams for hydroelectric power, and also by other factors, such as agricultural runoffs, logging, and urban development. Over the years, Mitchell Act hatchery production has changed to meet two other objectives. First, some hatchery production has shifted to areas above the Bonneville Dam in order to provide harvestable salmon under the Columbia River Treaty Indian Trust. Second, a portion of the hatchery production is being shifted to fulfil a conservation role in preserving endangered salmon stocks (captive breed) and supplementing their recovery. With the application of the Endangered Species Act throughout the Columbia River Basin, substantial changes have been, and will continue to be, required of the Mitchell Act Programme. The programme was funded at USD 16.9 million and USD 16.8 million for 2006 and 2007, respectively.
10. US Coast Guard fisheries law enforcement has domestic and foreign components, with the bulk of spending allocated to domestic enforcement. 2007 spending reflect enacted budget numbers; actual expenditures have not yet been reconciled or published.
11. The entire Sea Grant programme covers a range of activities unrelated to fisheries. The transfer amount given in this table is the share of the Sea Grant programme that supports fisheries and aquaculture science programmes. It should be noted that many of these programmes support basic science that is not applied to a specific fisheries and that all project reports are available to the public.
12. The entire S-K grants programme is listed under "general services" because practically all of these grants are awarded to support basic scientific and management missions.
13. Fisheries infrastructure, including the construction, maintenance and modernisation of fishing ports and landings facilities, is funded by many Federal and local agencies, such as the Army Corps of Engineers and various Port Authority and other local public works agencies. These transfers to fisheries infrastructure were not calculated and are therefore not included in this submission.
14. States with fairly large fisheries agencies include: Maine, Massachusetts, New York, New Jersey, Virginia, Florida, Texas, California, Oregon, Washington, Alaska, and Hawaii. These agencies generally deal with both freshwater and marine fisheries, and are funded from both State and Federal sources. It is assumed that the large bulk of their programmes fall in the "general services" category of transfers. No estimate of these State transfers is available.
15. Spending on aquaculture activities is spread across many state and Federal Agencies. The numbers here only represent the NMFS Office of Aquaculture programmes. This number is thus an underestimate as it does not include congressional earmarks for aquaculture, aquaculture spending by other NMFS programmes, or aquaculture spending by other US agencies (such as the USDA).

Table 29.5. **Fishing capacity reduction programmes (Buybacks) (USD million)**

		Buyback		Industry
Programme		Amount	Appropriation	Loan
Authorised industry funded buybacks (completed)				
Northeast Multispecies	1995	1.89	1.89	
Washington Salmon	1995	3.88	3.88	
Northeast Multispecies	1996	22.50	22.50	
Washington Salmon	1996	5.08	5.08	
Texas Shrimp	1997	1.40	1.40	
BSAI Pollock	1998	90.00	15.00	75.00
Northeast Multispecies	2002	10.00	10.00	
Pacific Coast Groundfish	2003	45.70	10.00	35.70
BSAI Crab	2004	97.40		97.40
BSAI Non-Pollock Groundfish	2007	35.00		35.00
Total		**312.85**	**69.75**	**243.10**
Authorised industry funded buybacks (not completed)				
BSAI Non-Pollock Groundfish		39.00		
Northeast Multispecies		45.00		
New England lobster		50.00		
SE Alaska purse seine salmon		24.00		
GOM reef fish		35.00		
Total		**193.00**		

Table 29.6. **Limited access privilege programmes**

Fiscal year	2006	2007	2008	2009	2010	2011
EOY target	8	10	12	12	15	16
Revised EOY target	8	10	12	12	13	16

Table 29.7. **Remaining targets to meet goal**

Year and quarter	Programme	Target date
FY 2011 Quarter 2	Pacific Coast Groundfish Trawl Rationalisation	1 January 2011
FY 2011	South Atlantic Snapper Grouper (Amendment 21)	
FY 2011	South Atlantic Red Snapper (Amendment 22)	

After years of negotiations between the United States and the European Union, in 2006 the European Union recognised the US seafood inspection system as equivalent to the European system. This recognition will facilitate seafood trade between the United States and the European Union by removing technical barriers, such as 100% controls at border inspection posts and restricted circulation of US seafood products currently limited to the country of first port of entry. US exporters still need to be approved and registered by the Food and Drug Administration before exporting seafood to the European Union. Since April 2006, US exporters are required to use a new public health certificate to export US fishery and aquaculture products to the European Union. Both the FDA and NOAA are competent authorities for issuing the certificates.

As both the FDA and NOAA issued health certificates to the EU confusion resulted. Since June 2008, all EU Health Certificates are to be completed by NOAA through its Seafood Inspection Programme. In addition, European Council Regulation No. 1005/2008 came into force 1 January 2010. The Regulation requires that most seafood exported by third parties to the EU market be accompanied by a catch certificate signed by a competent authority attesting to the fact that the seafood has been caught legally (non-IUU). In the case of the United States, the Regulation affects over USD 1 billion of direct US exports to the EU and many millions of dollars more indirectly through processing centres, such as China. NOAA Seafood Inspection Programme is the competent authority for the United States in respect of this EU IUU regulation.

Markets and trade

US per capita consumption of edible fishery products was 15.8 pounds (7.3 kg) of edible meat per person in 2009, slightly below the 2004 record per capita consumption of 16.6 pounds (7.6 kg). The majority of seafood consumed in the United States is in either fresh or frozen forms, followed by canned products consisting mostly of tuna (Table 29.8). US consumers spent an estimated USD 75.5 billion for fishery products in 2009. The 2009 total includes USD 50.3 billion in expenditures at food service establishments (restaurants, carry-outs, caterers, etc.); USD 23.8 billion in retail sales for home consumption; and USD 1.4 billion for industrial fish products.

NMFS launched FishWatch (*www.fishwatch.noaa.gov*) primarily as a consumer education tool, to identify the status of fishery stocks and understand the management and science requirements involved with building and maintaining sustainable fisheries. FishWatch provides consumers with relevant, factual data to assist in decisions about

Table 29.8. **US per capita consumption, 1987-2009 (pounds, edible meat)**

	Fresh and frozen	Fillets and steaks	Shrimp	Canned	Cured	Total
1987	10.7	3.6	2.4	5.2	0.3	16.2
1988	10.0	3.2	2.4	4.9	0.3	15.2
1989	10.2	3.1	2.3	5.1	0.3	15.6
1990	9.6	3.1	2.2	5.1	0.3	15.0
1991	9.7	3.0	2.4	4.9	0.3	14.9
1992	9.9	2.9	2.5	4.6	0.3	14.8
1993	10.2	2.9	2.5	4.5	0.3	15.0
1994	10.4	3.1	2.6	4.5	0.3	15.2
1995	10.0	2.9	2.5	4.7	0.3	15.0
1996	10.0	3.0	2.5	4.5	0.3	14.8
1997	9.9	3.0	2.7	4.4	0.3	14.6
1998	10.2	3.2	2.8	4.4	0.3	14.9
1999	10.4	3.2	3.0	4.7	0.3	15.4
2000	10.2	3.3	3.2	4.7	0.3	15.2
2001	10.3	3.4	3.4	4.2	0.3	14.8
2002	11.0	4.1	3.7	4.3	0.3	15.6
2003	11.4	4.3	4.0	4.6	0.3	16.3
2004	11.8	4.6	4.2	4.5	0.3	16.6
2005	11.6	5.0	4.1	4.3	0.3	16.2
2006	12.3	5.2	4.4	3.9	0.3	16.5
2007	12.1	5.0	4.1	3.9	0.3	16.3
2008	11.8	4.8	4.1	3.9	0.3	16.0
2009	11.8	4.6	4.1	3.7	0.3	15.8

Source: Fisheries of the United States.

sustainable seafood. The Web site's data is derived from a variety of NOAA sources, including stock assessments, fisheries surveys, fisheries management plans and amendments, environmental analyses and co-operative research. These sources were selected to ensure that the information on FishWatch is the most timely and accurate available on US fisheries. While the main objective of the site is to educate seafood consumers about domestically harvested seafood species, the utility of the site has had a far greater reach. Information on the site is utilised by 3rd party sustainable seafood education and advocacy campaigns; by industry to support US wild-caught seafood in both domestic and foreign marketplaces; and by culinary professionals. FishWatch has also served as an example for international organisations, such as the Asian Fisheries Society, as they are in development of a similar programme, FishWatch-AsiaPacific.

US imports of edible fishery products in 2009 were valued at USD 13.1 billion, USD 1.05 billion less than in 2008. The quantity of edible imports was 5.2 billion pounds, 64.4 million pounds less than the quantity imported in 2008. Edible imports consisted of 4.3 billion pounds of fresh and frozen products valued at USD 11.3 billion, 716.5 million pounds of canned products (USD 1.4 billion), 90.6 million pounds of cured products (USD 256.1 million), 6.4 million pounds of caviar and roe products (USD 28 million) and 51.4 million pounds of other products (USD 110 million). The quantity of shrimp imported in 2009 was 1.2 billion pounds, 34.6 million pounds less than the quantity imported in 2008. Valued at USD 3.8 billion, shrimp imports accounted for 29% of the value of total edible imports. Imports of fresh and frozen salmon, including fillets, were 500.8 million pounds valued at USD 1.6 billion in 2009. Imports of fresh and frozen tuna were 319.8 million pounds, 52.3 million pounds less than the 372.1 million pounds imported in 2008. Imports of

canned tuna were 398 million pounds, a 20.2 million pound increase over 2008. Imports of fresh and frozen fillets and steaks amounted to 1.3 billion pounds, a slight increase from 2008. Regular and minced block imports were 139.9 million pounds, a decrease of 2.2 million pounds from 2008.

United States exports of edible fishery products were 2.5 billion pounds valued at USD 4 billion, a decrease of 103.8 million pounds and USD 277.1 million compared to 2008. Fresh and frozen exports were 2.2 billion pounds valued at USD 3.3 billion, a decrease of 50.2 million pounds and a decrease of USD 143.4 million compared with 2008. Fresh and frozen exports consisted principally of 292 million pounds of salmon (USD 446 million), 191.5 million pounds of surimi (USD 212.7 million) and 53.1 million pounds of lobsters (USD 328.3 million). Canned items were 166.9 million pounds (USD 274.7 million). Salmon was the major canned item exported, with 97.3 million pounds (USD 194.1 million). Cured items were 5.1 million pounds (USD 15.5 million). Caviar and roe exports were 76.3 million pounds (USD 341.4 million). Exports of non-edible products were valued at USD 15.7 billion, a decrease of USD 3.5 billion when compared with 2008. Exports of fish meal amounted to 174.6 million pounds (USD 78.7 million). The total value of edible and non-edible exports was USD 19.6 billion, a decrease of USD 3.7 billion compared with 2008.

The US trade policy for fish and fisheries products is driven by a number of underlying precepts. The United States recognises that, without sustainable fisheries, there can be no long-term, commercially viable trade in seafood. Therefore, the concepts of conservation and sustainability are at the core of US trade policy. Additionally, the United States takes the position that tariffs and quantitative restrictions on trade are, for the most part, ineffective substitutes for good management. As a country with relatively low tariffs on fish and fish products, the United States supports liberalising global trade in these products. To accomplish these outcomes, the United States has actively promoted market access and fisheries subsidies reform negotiations at the WTO.

Outlook

Despite the suspension of active negotiations under the Doha Development Agenda, the United States will continue to work toward liberalising trade in the fisheries sector. To this end, the United States will pursue bilateral and regional free trade agreements as appropriate and, should the Doha Round of multilateral negotiations be revived, continue working toward a successful conclusion of the Doha Development Agenda or its successor at the World Trade Organisation.

National catch shares policy[7]

On 10 December 2009, the US National Oceanic and Atmospheric Administration (NOAA) released for public comment a draft national policy encouraging the use of catch shares, a fishery management tool that aims to end overfishing and rebuild and sustain fishing jobs and fishing communities. Catch share programmes, which include Limited Access Privilege programmes and individual fishing quotas, have been used in the United States since 1990. A catch share programme differs from traditional fishery management by dividing up the total allowable catch in a fishery into shares. These shares are typically allocated based on historical participation in the fishery. They may be assigned to individuals, cooperatives, communities or other entities. Catch share participants agree to stop fishing when they have caught as much as they are allowed. Under traditional management programmes, fishermen compete for a total allowable catch. This has lead to fishermen racing each other to catch as many fish as

they can before the total catch limit is reached. This results in more boats and gear than necessary, quotas being exceeded, increasingly shorter fishing seasons, unsafe fishing and high levels of bycatch. It also may result in too many fish brought to market at once, reducing their market value to fishermen and coastal communities.

Halibut fishermen had been reduced to a fishing season of less than a week just before the North Pacific Fishery Management Council introduced an individual fishing quota programme. Under this catch share programme, fishermen have a quota they can catch over a season that now runs from March to November. The programme has dramatically reduced fishing accidents, extended the sale of fresh halibut for a premium price, given fishermen time to avoid bycatch of undersized halibut and other bycatch and promoted sustainable management of the fishery. The programme has reduced the number of people holding fishing permits while providing those in the industry with more stable and sustainable jobs.

Among the policy's components:

- Development of a catch share programme is voluntary. NOAA will not mandate the use of catch shares in any commercial, recreational, or subsistence fishery.
- The individual fishery management councils will consult fishing communities to evaluate the data, effects, and enforceability of any potential catch share programme before moving forward. In some cases, councils may find catch shares not to be the most appropriate management option.
- NOAA will provide leadership and resources and work in partnership with fishery management councils, states and members of the public to help with the implementation of catch shares. This includes assisting fishing communities as they make the transition, and conducting regional workshops, online seminars, and other educational and outreach programmes.
- Well thought-out and developed catch share programmes will promote sustainable fishing communities by supporting good jobs, and promoting preservation of wharfs, processing facilities, and fuel and ice suppliers.
- Catch share programmes can be designed to set aside shares to allow new participants into the fishery, including new generations of fishermen, small businesses, or others.

National framework for coastal and marine spatial planning

On 12 June 2009, President Obama issued a memorandum establishing an US Interagency Ocean Policy Task Force charged with developing a recommended framework for improved stewardship, and effective coastal and marine spatial planning as well as a recommendation for a national policy that ensures protection, maintenance, and restoration of oceans, coasts and the Great Lakes.

On 14 December 2009, the Task Force released its Interim Framework[8] for Effective Coastal and Marine Spatial Planning (Interim Framework) for a 60-day public review and comment period. With competing interests in the ocean, the coasts and the Great Lakes, the Interim Framework offers a comprehensive, integrated approach to planning and managing uses and activities. Under the Framework, coastal and marine spatial planning would be regional in scope, developed cooperatively among Federal, State, tribal, local authorities, and regional governance structures, with substantial stakeholder and public input. The Interim Framework includes a number of important provisions that would

significantly overhaul the US Federal Government's approach to coastal and marine planning, including:

- A *new approach to how to use and protect the ocean, coast, and Great Lakes*. The Interim Framework is designed to: decrease user conflicts; improve planning and regulatory efficiencies and decrease their associated costs and delays; and preserve critical ecosystem function and services. The Interim Framework describes how such plans would be developed and implemented, and provides timeframes and steps for phased implementation of the framework.
- *Move away from sector-by-sector and statute-by-statute decision-making*. While many existing permitting processes include aspects of coordinated planning, most focus solely on a limited range of management tools and outcomes (*e.g.* oil and gas leases, fishery management plans, and marine protected areas). Comprehensive marine spatial planning presents a more integrated, comprehensive, ecosystem-based, flexible, and proactive approach to planning and managing uses and activities.
- *Bring Federal, state, and tribal partners together in an unprecedented manner to jointly plan for the future.* The Interim Framework is not a top-down planning effort. Rather, it describes a new approach to Federal resource planning that is regionally based and developed cooperatively among Federal, State, tribal, and local authorities, and regional governance structures, through the establishment of nine regional planning bodies.
- *Places science-based information at the heart of decision-making*. Scientific data, information and knowledge, as well as relevant traditional knowledge, will be the underpinning of the regionally developed plans.
- *Emphasise stakeholder and public participation*. The planning process would be fully transparent and participatory – requiring frequent and robust stakeholder engagement throughout all steps of the process (*i.e.* development, adoption, implementation, adaptation and evaluation).

Notes

1. The one exception is highly migratory species along the Atlantic coast of the United States, which are managed directly by the National Marine Fisheries Service.
2. Report to Congress on Excess Harvesting Capacity in US Fisheries, 28 April 2008.
3. Status of US Fisheries Stocks Reports from 1997 to 2007: *www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm*.
4. *Fisheries Economics of the United States 2006* is available online at: *www.st.nmfs.noaa.gov/st5/index.html*.
5. Additional data: *www.st.nmfs.noaa.gov/st1/recreational/queries/index.html*.
6. *Fisheries Economics of the United States 2008* is available online at: *www.st.nmfs.noaa.gov/st5/index.html*.
7. *www.nmfs.noaa.gov/catchshares*.
8. *www.whitehouse.gov/administration/eop/ceq/initiatives/oceans/interim-framework*.

PART IV

Non-member Economies

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Policies and Summary Statistics
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PART IV

Chapter 30

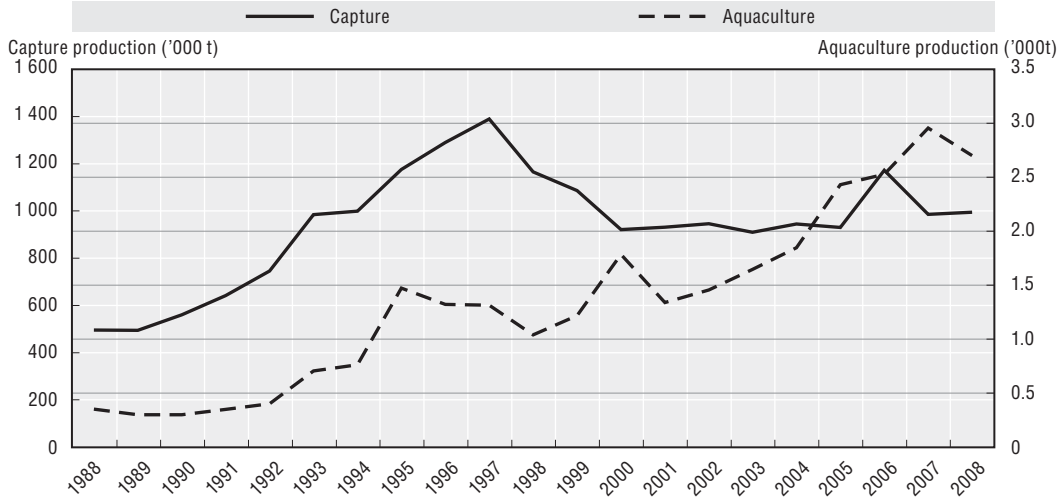
Argentina

Argentina

Summary of recent developments

- The Ministry of Agriculture, Livestock and Fisheries was created in 2008, and the Undersecretariat of Fisheries and Aquaculture is under the auspice of the Ministry.
- An Individual Transferable Quotas (ITQ) system entered into force for hake, southern blue whiting, longtail hake and Patagonian toothfish.
- Argentina has the following National Plans of Action: National Plan of Action to Prevent Deter and Eliminate Illegal, Unreported and Unregulated fishing, National Plan of Action for the Management and Conservation of Sharks (sharks, rays and skates), National Plan of Action for Reducing the Interaction of Seabirds with Fisheries in the Republic of Argentina.
- A capture surveillance system along the entire value chain has been established (both for exports and domestic market) to prevent illegal fishing.
- The years 2008 and 2009 have been marked by low profitability in the fisheries sectors. The international crisis negatively affected exports, especially during the first semester of 2009. In addition, in 2009 there was a drop in squid catches, which usually generate important export income.

Harvesting and aquaculture production (tonnes)

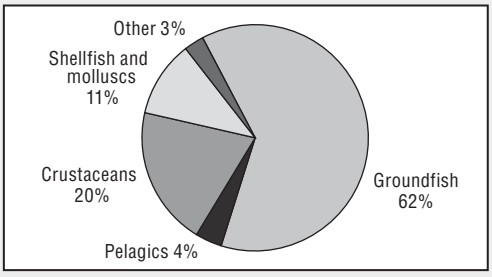


Source: FAO FishStat Database.

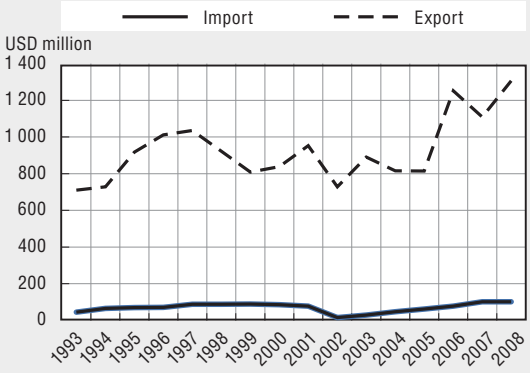
Key characteristics of the sector

- Natural cyclic fluctuations of squid stocks have caused a decrease in landings in 2008 and 2009.
- Groundfish accounts for the largest share of Argentinean landings and consists mainly of hake. Limitations of hake catches also explain the decrease in landings as four species (hake, squid, shrimp and longtail hake) account for about 60% of total Argentinean landings.
- The international crisis affected Argentinean fish exports. Shrimp trade and prices decreased while hake exports increased in 2009 compared to 2008. The European Union, in particular Spain and Italy, are the key markets for Argentina. With respect to imports, the total value in 2009 was USD 98 million (32 000 tonnes), a 6% decline in volume and of 3% in value.
- In 2009, the Argentinean fleet was composed of 1 149 vessels, and 524 of these had provincial licenses. The marine capture subsector employed 22 598 people in 2008 and 22 977 in 2009. The catch per fleet between 2006 and 2009 declined for jiggers as squid stocks decreased.

Key species landed by value in 2008



Trade evolution (USD millions)



Capacity

	2000	2008	% change
Number of fisher	16 554	23 068[1]	39.4
Number of fish farmers	n.a.	n.a.	n.a.
Total number of vessels	655	634	–3.2
Total tonnage of the fleet	198 672	193 537	–3

1. Includes processing.

Institutional framework

In October 2009, the Ministry of Agriculture, Livestock and Fisheries was created, replacing the Secretariat of Agriculture, Livestock and Food. The Undersecretariat of Fisheries and Aquaculture is under the auspice of the Ministry of Agriculture, Livestock and Fisheries.

In the Republic of Argentina, fishing is regulated by Law 24922 – Fisheries Federal System (1998, *www.infoleg.gov.ar*). According to the Law, living resources of inland and coastal waters – up to the twelve miles measured from the base lines stated by the corresponding national law – are under jurisdiction of the maritime coastal provinces (Buenos Aires, Río Negro, Chubut, Santa Cruz and Tierra del Fuego, Antártida and Islas del Atlántico Sur). The provinces have jurisdiction over the resources in terms of exploration, exploitation, management and preservation, within the federal framework.

The marine living resources that are in waters of the Argentinean Exclusive Economic Zone and in the Argentinean continental shelf from the twelve nautical miles on are exclusive jurisdiction of the State. Hence, in the Republic of Argentina there is one national fisheries agency and five provincial agencies.

As a superior authority, the Law created the Federal Fisheries Council (CFP). In this council there are: *a)* a representative of each of the maritime coastal provinces; *b)* a representative of the Undersecretariat of Fisheries and Aquaculture; *c)* a representative of the Secretariat of Environment and Sustainable Development; *d)* a representative of the Ministry of Foreign Affairs, International Trade and Culture; and *e)* two representatives chosen by the National Executive Power. The chairman is the Undersecretary of Fisheries and Aquaculture (*www.cfp.gov.ar*). The CFP, among other functions, is responsible for; establishing the national fisheries and the research policies, for planning the national fisheries development, for setting annual catch quotas, for vessel, for species, for fishing area and for type of fleet, for setting total allowable catch (TAC) for each species (it is stated for all the species distribution area, irrespective of the jurisdiction) according to the maximum sustainable yield. This last function is done in accordance with data provided by the National Institute for Research and Development of Fisheries (INIDEP).

Commissions of analysis and surveillance have been created and they work as advisors; the public sector, the private sector related to the corresponding species fishery, and INIDEP take part in these commissions. These commissions have been settled for the fisheries of southern blue whiting, Patagonian toothfish, squid, shrimp, scallop, anchovy (Patagonian stock), southern king crab, longtail hake and hake.

The Republic of Argentina and the Oriental Republic of Uruguay share a fishing zone that is managed through the Technical Mixed Commission of the Argentinean-Uruguayan Maritime Front (*www.ctmfm.org*).

With respect to aquaculture, each province – according to Section 124 of the National Constitution of 1994 – is the owner of its natural resources and the competent authorities regulate this sector.

With regard to inland fisheries, there is at present no specific law at the national level. The Commission for Aquaculture and Inland Fisheries (CPCyA), within the Agricultural Federal Council (CFA), was created in 2004 to harmonise management policies related to the watershed and co-ordinating the different interests of the provincial managements. Parties to the CPCyA are the Undersecretariat of Fisheries and Aquaculture and the seven Paraná coastal provinces, a representative of the State Secretariat of Environment and

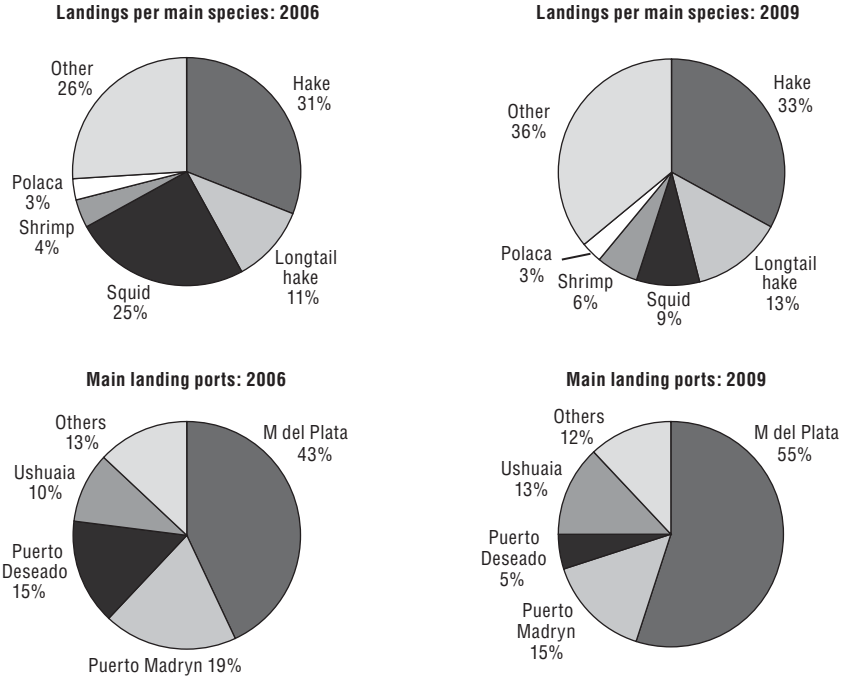
Sustainable Development (SAyDS) and another one of the National Agrifood Health and Quality Service (ex-National Agroalimentation Quality and Safety Service – SENASA).

Capture fisheries

Performance

Total landings in 2008 and 2009 decreased compared to the average for the period 2006-09, with the most dramatic drop in 2009. This is directly related to the squid harvest, a species with an annual life cycle and which shows fluctuations that are not related to catch pressure. Sixty per cent of Argentinean landings are represented by four species: hake, squid, shrimp and longtail hake. Hake catches have been limited since the crisis that started at the end of the 1990s. As a consequence, catches decreased during 2008-09.

Figure 30.1. **Landings (%)**



Landings per port depend on catch fluctuations. Jiggers that pretended to fish squid moved from the southern ports to the Mar del Plata port due to economic and financial problems (low catches, higher port costs). In addition, the international crisis and the increase of domestic costs – especially manpower and stowage, together with the payment of provincial licenses for fishing shrimp – affected the southern ports more (Puerto Madryn and Deseado).

Data on the catch per fleet between 2006 and 2009 shows a decline for jiggers (fewer vessels fished for shorter periods).

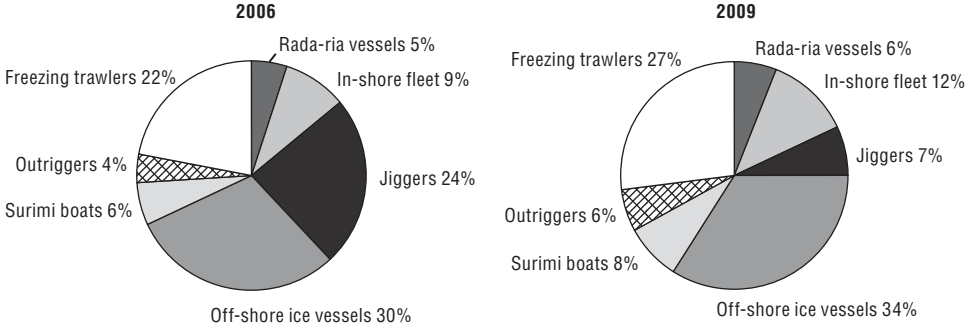
In 2009, the Argentinean fleet was composed of 1 149 vessels. 524 of them had provincial licenses. The marine capture subsector employed 22 598 people in 2008 and 22 977 in 2009.

Inland fisheries in Argentina focus on sábalo (shads) which is also exported. Shad landings in the last years were 20 000 t/year, mainly caught in the Paraná river in the

Table 30.1. **Total landings per main species (tonnes)**

Species	2006	% Share	2007	% Share	% 2006-07	2008	% Share	% 2007-08	2009	% Share	% 2008-09
Pink cuskeel	20 588	1.8	20 609	2.1	0.1	17 558	1.8	–14.8	16 693	2.0	–5
Whitemouth Croaker	26 723	2.3	25 654	2.7	–4.0	22 417	2.3	–12.6	26 601	3.2	19
Notothenia	9 842	0.9	8 355	0.9	–15.1	12 433	1.3	48.8	16 645	2.0	34
Argentine anchovy	31 385	2.7	27 824	2.9	–11.3	22 887	2.3	–17.7	27 721	3.3	21
Squid	292 079	25.6	233 062	24.1	–20.2	255 531	26.0	9.6	71 419	8.5	–72
Chub mackerel	6 081	0.5	10 631	1.1	74.8	13 354	1.4	25.6	12 792	1.5	–4
Patagonian Smoothhound	9 396	0.8	9 142	0.9	–2.7	10 362	1.1	13.3	8 990	1.1	–13
Shrimps	44 405	3.9	47 619	4.9	7.2	47 406	4.8	–0.4	53 616	6.3	13
Longtail hake	124 608	10.9	98 782	10.2	–20.7	110 267	11.2	11.6	110 705	13.1	0
Hake	355 618	31.1	301 691	31.2	–15.2	263 323	26.8	–12.7	280 736	33.2	7
Southern blue whiting	31 292	2.7	18 979	2.0	–39.3	19 841	2.0	4.5	21 676	2.6	9
Others	190 404	16.7	163 109	16.9		188 457	19.2	15.5	196 821	23.3	4
Total	**1 142 420**	**100.0**	**965 457**	**100.0**	**–15.5**	**983 836**	**100.0**	**1.9**	**844 416**	**100.0**	**–14.2**

Figure 30.2. **Catch per fleet (2006 and 2009)**



provinces of Santa Fe and Entre Ríos. Each province maintains catch statistics. In addition to shads there are other species like bream, armado, yellow catfish, catfish, manguruyú, large fresh-water catfish (surubí), dorado, pacú, patí, rays, armado chancho, river salmon, manduví, pira para, piraña, whose landings at a global level do not surpass 20% of the value generated by shads.

According to available reports – which have been developed during the last five years – the present situation of the target stocks is quite good. Exploitation levels can be qualified as moderate if compared to the ones of many other rivers of the world.

Management of commercial fisheries

In 2009, the most important change with regard to fishing resources management was the establishment Individual Transferable Quotas systems for the following species: hake, longtail hake, southern blue whiting and Patagonian toothfish. Gradual changes allowed an agreement among the public and private sector to achieve acceptance and to implement the system (Acts CFP 49/2009 and Annexes; Regulations CFP 20/24, 29 and 30 of 2009, *www.cfp.gov.ar*).

For the so-called "variado costero" fishery of Buenos Aires a set of management measures have been put in place (Regulation CFP No. 27).

Table 30.2. **Status of Argentinean fish stocks**

Patagonian toothfish (*Dissostichus eleginoides*) (Merluza negra)	The spawning biomass of 2009 has increased slightly above the targeted spawning biomass: 30% of virgin spawning biomass. Fewer vessels have been allowed to catch targeted species and in addition Individual Transferable Quotas have been introduced so that the stocks exploitation appeared to be in a better situation. TAC 2009: 2 500 tonnes; Landings: 2 434 tonnes.
Longtail hake (*Macruronus magellanicus*) (Merluza de cola)	In the period 2008-09, there have been no changes in the stock of longtail hake. The spawning biomass has decreased approximately 5%. The trend of the spawning biomass has shown fluctuations as well as its captures. TAC 2009: 170 000 tonnes; Landings: 110 705 tonnes.
Southern blue whiting (*Micromesistius australis*) (Polaca)	The decreasing trend of the stock until 2008 turned to a slight increase in 2009. The spawning biomass is still decreasing. TAC 2009: 60 000 tonnes; Landings: 21 676 tonnes.
North stock in 41° LS of Argentine hake (*Merluccius merluccius hubbsi*) (Merluza)	The spawning biomass of 2008 did not reach the biological references points (limit and objective of 130 000 tonnes and 200 000 tonnes, respectively).
South stock de 41° LS of Argentine hake (*Merluccius merluccius hubbsi*) (Merluza)	The spawning biomass did not reach the biological references points (limit and objective of 400 000 tonnes and 500 000 tonnes, respectively). TAC 2009: 207 000 tonnes; Landings: 213 827 tonnes.
Whitemouth croaker (*Micropogonias furnieri*) (Corvina)	Capture values must not be increased and the management of this species must be carefully checked due to the fact that there are too many juveniles in landings. TAC 2009: 36 000 tonnes; Landings: 26 575 tonnes.
Shrimp (*Pleoticus muelleri*) (Langostino)	The available biomass to be caught by the coastal and the offshore fleet has remained stable in the last five years (2006-10). Permanent or provisional closed areas have been applied to the three jurisdictions (two provincial ones and the national jurisdiction) and that, together with a decrease of the fishing pressure during the spawning season have helped to keep a quite stable exploitation state.
Squid (*Illex argentinus*) (Calamar)	There are two management units (North and South of the 44° S) and four stocks (SSP, SDV, SBNP and ADP) that are evaluated annually. The evaluations are done in real time, with weekly updates during the fishing season (January-August).
Patagonian scallop (*Zygochlamis patagonica*) (Vieira)	No important changes have been observed in the total and commercial biomass in the North Sector during the period 2008-09. In the South sector, there was an increase in the total biomass as well as in the commercial one in 2008.

Table 30.3. **Fisheries management measures in Argentina**

Output controls and supporting technical measures	Input controls and supporting technical measures
TACs	Since 1998, no new licenses are being granted at a national level.
ITQs	Replacement of vessels. Only in the cases when the fleet capacity has not increased.
Catch authorisations (species without ITQs system applied)	It is compulsory to use selective fishing gear for shrimp and hake (juveniles' protection). Vessels size limitation for fishing in specific fisheries and zones. Restriction of fishing gear and of fishing areas for some fisheries. Limitation of fishing days for some fleets in some fisheries. Limitation on the time of the day when the catch is done depending on the type of fishing gear and on the target species. Fishing seasons limits.

Other measures include the following:

- Minimum size.
- Permanent or provisional closed areas according to the fishery. Permanent closed areas have been widened or modified in accordance with the state of the resource.
- To fight IUU fishing, a surveillance system of catches has been developed – in addition to the obligations stated by the buyer countries – that comprises products for export and for the domestic market.

With regard to Argentinean squid, the escape ratio is used to decide whether to continue fishing or not. In the shrimp fishery, variable closures are have been implemented.

The National Plan of Action for the Management and Conservation of Sharks (sharks and skates) in the Republic of Argentina was passed in 2009 (*www.minagri.gob.ar* – Pesca marítima). In the EEZ as well as in the Argentinean-Uruguayan Common Fisheries Zone the trade of fins obtained through discarding is prohibited as well as the use of "bicheros". It is compulsory to discard living sharks of more than 1.60 m. In the Argentine EEZ, it has been stated that only a bycatch of up to 40% of skates/sharks per fishing trip is authorised. When there is more than 40% of bycatch the vessel must move to another fishing area.

The Argentinean-Uruguayan Common Fisheries Zone employs common measures; total allowable catch of hake (in 2009 of whitemouth croaker and Stripped weakfish, as well), closed area restrictions for some fishing gear, prohibition of fishing gear for some species, catch assignments, provisionally closed areas, and areas of restricted fishing effort for some vessels.

As a member of CCMLAR Argentina applies the measures of this organisation – already incorporated in the national legislation – to vessels authorised to operate within the Convention area.

With regard to inland fisheries, even if each province is responsible of the exploitation and management of its fishing resources the Agricultural Federal Council (CFA) has advising functions, especially for problems that may involve more than one province, being able to bring solutions to each case. The CFA has created a Commission of Inland Fisheries and Aquaculture (CPCyA). The main objective of this commission is to analyse, to check, coordinate and harmonize the main actions of the provincial fishery management units to allow for a sustainable management of the inland fisheries.

According to the agreements reached by the CPCyA of the CFA, the Ministry of Agriculture, Livestock and Fisheries sets the annual catch assignments for exports which are assessed by the provincial authorities within the respective territories. Catch quotas and export assignments have been assessed for shad (*Prochilodus spp*.) exports. Precautionary catch quotas as well as export assignments have also been assessed for the other commercial species, especially for boga (*Leporinus spp*.), tararira (*Hoplias spp*.) and surubí (*Pseurdoplatystoma spp*.).

Access closures to inland fisheries based on CFA agreements have been implemented, particularly in the subwatershed of Paraguay-Paraná rivers. Authorisations for new cold storage plants have been halted. Another tool used by the provinces to limit the pressure on fishing resources has been to limit the granting of fishing licenses.

The provinces determine fishing gear authorisations and minimum sizes for all commercial species. There also are seasonal closures and in some cases, individual catch quotas per species.

Small scale artisanal fisheries are very important as a source of employment for coastal populations and as fish supply to coastal communities and other areas to which seafood products are not otherwise distributed. Subsistence fishing contributes significantly to the survival of low income coastal populations. There are regulations to protect artisanal fisheries through licenses restrictions and to avoid industrialisation.

Monitoring programmes have begun to be developed to check the fishing resource state in areas of the watershed where fishing pressure is higher.

Provinces are developing systems to gather information about landings and fish trade.

Many research projects have been approved and will provide useful information for the management of the inshore fisheries:

- Fisheries Management and Conservation of the Biodiversity of the Fluvial Wetlands in the rivers Paraná and Paraguay, Argentina will be carried out with budgetary input from the United Nations Development Programme (UNDP-GEF; Proyecto FMAM 4205).
- Surveys in the upper region of the Paraná (Chaco and Corrientes – Undersecretariat of Fisheries and Aquaculture); agreement and budget.
- Evaluation of ichthyic resources of the low river Uruguay and the inner Río de la Plata (CARP-CARU-SSPyA-DINARA).
- Conservation of ichthyic fauna and of the resources of the river Uruguay (CARU-SSPyA-DINARA).

There are no arrangements for access of foreign vessels to Argentine fisheries.

Management of recreational fisheries

Recreational and ornamental fishing associated with tourism is increasing and with important economic consequences. The provinces implement specific regulations for this that establish quotas per fisher, minimum sizes and allowed fishing gear.

Monitoring and enforcement

In order to enforce the Federal Fisheries Law 24922 and other regulations, surveillance tasks are actively carried out by the Department of Control and Surveillance through satellite monitoring of the fleet, analysis of data and the information given by the ship's owner on board or in ports. The control and surveillance staff plays an important role in checking fishing gear, selectivity devices, landings and collecting information that helps decisions on fishing policies, on the planning of resource exploitation, and on scientific technical aspects. The staff is trained in specific courses given in the National Institute for Research and Development of Fisheries (INIDEP).

At present, a system with cameras is being tested onboard a vessel. These cameras are installed to continuously record activities on board, including catch activities and work on deck. This system is still being tested and was developed by INVAP. It is inviolable and can work 24 hours a day. The system is being tested for the engines and the movement of the nets. Accompanying regulations are also under development. No other country has this type of system which is planned to be used in Argentina.

Multilateral agreements and arrangements

In the rivers shared with the Republic of Paraguay and the Oriental Republic of Uruguay, the enforcement of resource regulations is carried out according to international treaties. The regulations that implement international conventions are as follows:

- Law No. 25548 passes the Convention on conservation and development of ichthyic resources in the border lines of the rivers Paraná and Paraguay. It creates the Coordinator Committee and the Argentinean-Paraguayan Mixed Commission (COMIP), which is the Permanent Secretariat of the Coordinator Committee.
- Law No. 21413 passes the by-laws of River Uruguay, creating the Managing Commission of the river Uruguay (CARU).

- Law No. 20645 passes the Río de la Plata Treaty and its Maritime Front. The Managing Commission of the Río de la Plata (CARP) is the corresponding organism to the inland fishing.

Aquaculture

At present, production is low and difficult to increase as most producers are small and medium sized. The main species are trout (60% of total production) and pacu (24%). Table 30.4 illustrates breeding capacities in 2009.

Table 30.4. **Breeding facilities, value and volume**

Number of facilities	Without data (ponds + cages)
Volume (total)	2 605 tonnes
Value (total)	USD 11 million

Fisheries and the environment

In accordance with the Federal Fisheries Council statement, the Undersecretariat of Fisheries and Aquaculture established, through Regulation 250 of 26 September 2008 (*www.infoleg.gov.ar*) a total and permanent area closure for fishing in national jurisdiction waters within the Banco Burdwood, in the area located in the coordinates 54° 30' S and 60° 30' W; 54° 30' S and 59° 30' W; 54° 15' S and 60° 30' W; 54° 15' S and 59° 30' W.

The Federal Fisheries Council considered that it was necessary to encourage the preservation of the sea beds, especially in the cases of the ones that have species that are of limited distribution, that are endemic, vulnerable, fragile or of slow recovery. Based on the research carried out in the mentioned area and taking into account that there is a group of species with limited distribution and vulnerable, fragile or slow recovery skeletons, this area was defined as "a vulnerable, fragile or sensitive ecosystem" and is thus an area of particular interest.

Argentina has implemented regulations of mitigation for incidental catch of seabirds:

http://infoleg.mecon.gov.ar/infolegInternet/anexos/140000-144999/142624/norma.htm.

http://infoleg.mecon.gov.ar/infolegInternet/anexos/155000-159999/157319/norma.htm.

In 2008, the CFP adopted the National Plan for Reducing the Interaction of Seabirds with Fisheries in the Republic of Argentina (*www.minagri.gob.ar*). Argentina is full member of the Agreement on the Conservation of Albatrosses and Petrels (ACAP).

The scallop fishery is already MSC certified and the longtail hake fisheries are under assessment.

Post harvesting policies and practices

Food safety, information and labelling

The National Agrifood Health and Quality Service (SENASA) is the governing sanitary organism whose main objective is the control and certification of products and sub-products of animal origin, as well as their inputs. It carries out tasks of prevention, eradication and testing of animal diseases, including the ones that can be transmitted to human beings. It registers, authorizes and controls vessels, processing plants, conditioning, transport and trade of aquaculture and fishing products. In addition, it verifies transport, imports and exports of products, sub-products and derived ones of

fishing or farming origin. The system used to control the plants is HACCP. A traceability system is under development.

The Ministry of Agriculture, Livestock and Fisheries enforces Codex Alimentarius regulations and SENASA depends on this Ministry. There is a Codex Advisor Commission whose members are the Ministry, SENASA and the private sector.

The Plan CREA is being developed by SENASA to control wastes (chemical, metabolic, etc.). It has also developed "good management practices" and "good practices for the management of Salmonidae aquaculture". One of SENASA functions is to identify data that should be displayed at fish product packaging.

SENASA together with the Undersecretariat of Fisheries and Aquaculture is developing a plan of area classification for bivalve mollusks (maritime areas) and has already sent all the necessary requirements to declare the area of salmonidae (rainbow trout) as an "area free of diseases of compulsory denounce" to the World Organization for Animal Health.

Through the National Institute of Food, the National Institute of Medicines, Food and Technology (ANMAT) carries out the surveillance of food and develops recommendations. For instance, it publishes warnings, including for fisheries productions. Other tasks are the early identification of non-compliance with the Argentinean Food Code, discards of contaminated products, the modification of bad processing and handling practices in the industry and at home, the prevention and control of food borne diseases and the control of product label information.

Processing and handling facilities

According to SENASA data, there are 309 processing facilities for seafood products. Table 30.3 illustrated the location of these establishments.

In addition to these establishments, there are others that are authorised by the provinces and whose output cannot surpass the limits of their jurisdictions.

Table 30.5. **Location of processing facilities**

Province	Facilities
Buenos Aires-Cdad. De Mar del Plata	168
Buenos Aires-Gran Buenos Aires	16
Buenos Aires-Resto	20
Chubut	28
Santa Cruz	22
Río Negro	13
Santa Fe	14
Ciudad Autónoma de Buenos Aires	10
Tierra del Fuego, Antártida e Islas del Atlántico Sur	4
Entre Ríos	4
Mendoza	3
Misiones	2
Formosa	2
Córdoba	2
Neuquén	1
Total	**309**

Mar del Plata is where most processing plants for maritime fisheries are to be found, followed by the Southern ports of Chubut and Santa Cruz. These latter ones have been

through economical difficulties lately and some plants have closed due to the fact that there were no raw material to process (squid) together with the crisis they had to face.

Table 30.6. **Fisheries products by product category (tonnes)**

Products	2008	2009
Total	**589 034**	**531 411**
Fish fresh, chilled or frozen	299 049	338 331
Fish dried, salted or smoked	12 355	8 608
Crustaceans and mollusks	230 392	144 331
Preserved fish	3 259	1 332
Preserved crustaceans and mollusks	243	307
Oil	1 543	1 015
Flours	42 193	37 487

Markets and trade

In 2008, exports reached 561 000 tonnes for a value of USD 1.3 billion. The Argentinean fisheries market was affected by the global financial crisis. In 2009, fishing exports reached 484 thousand tonnes for a value of USD 1.1 billion, a 14% drop in volume and value compared to 2008.

The shrimp fisheries have been affected by the international crisis. There has been a decrease in trade and a negative impact on prices. In addition, Argentinean companies faced strong competition from aquaculture products which caused international prices to fall even more. As a consequence of lower incomes, the sector has difficulties in facing high operational costs, labour costs in particular.

With regard to Argentinean squid, even if the situation improved in 2008, it has not been sufficient to regain the sector profitability. In fact, during the 2008 season, many jiggers finished operating before the end of the season. In 2009, prices were higher, but the fishery faced scarce availability of the resource. As a result, there was an early season closure.

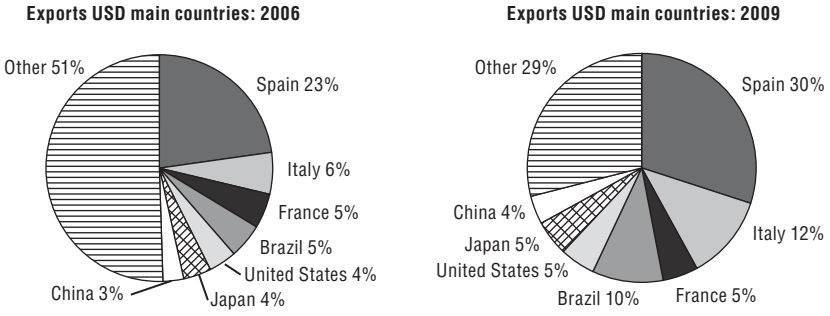
Hake exports increased in 2009 compared to 2008. Nevertheless, the financial crisis affected the main markets. The most affected countries were the developed ones, causing a decrease in trade. The international crisis showed its worst effects in 2008 when exports increased by only 1%. Fortunately, in the second semester of 2009 there was a recovery of both exported volume and value.

In 2009, the main exported products were fillets and other fish meats, accounting for 34% of the exports values. The main species of this category was hake. 29% of the exported products were crustaceans with a share similar to the previous years. Mollusks had a share of a 10% due mostly to the low catches of Argentinean squid. Frozen fish excluding fillets provided 20% of the export value.

The European Union is still the main market, with Spain and Italy being the most important markets with a share of 32% for the first one and 10% for the latter. Even if the relative shares of these countries remained stable, volumes have substantially decreased in both of them. France is the third destination in the European Union, followed by Germany.

Outside the European Union, there was an evolution of the Brazilian and Chinese markets. The first one increased its share and export volume by 44%, while the Chinese market fell by 49% in volume.

Figure 30.3. **Main export markets (2006 and 2009)**



In 2009, imports reached 32 000 tonnes for a value of USD 98 million, a fall of 6% in volume and of 3% in value. Prepared or preserved fish were the main imported products, accounting for 70% of the total import volume, fresh or chilled fish excluding fillets for 8% and prepared or preserved seafood for 5%. The main countries of origin were Chile, followed by Ecuador, Brazil and Thailand.

Figure 30.4. **Main import countries (2006 and 2009)**

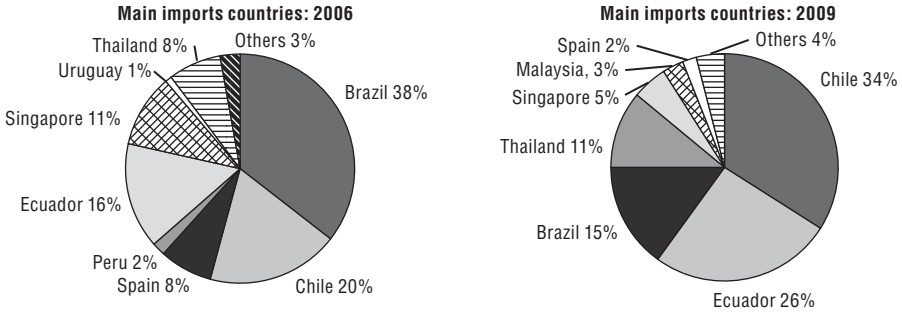


Table 30.7. **Imports in 2008-09**

Description	2008		2009		Variation	
	Tonnes	USD '000	Tonnes	USD '000	Tonnes (%)	USD (%)
Live fish	3	191	5	188	67	–2
Fresh or chilled fish exc. fillets	2 743	14 060	2 574	14 593	–6	4
Frozen fish exc. fillets	1 717	3 199	1 310	3 308	–24	3
Fillets and other fish meats	781	3 567	807	3 925	3	10
Fish dried, salted or in brine, smoked/flour/meals and pellets. Fit for human consumption	158	1 384	115	1 003	–27	–28
Crustaceans	263	1 613	379	2 299	44	43
Mollusks	1 307	3 839	1 243	2 994	–5	–22
Products not expressed in other chapters. Unfit for human consumption	435	1 198	305	416	–30	–65
Fats and oils of fish or marine mammals	72	272	22	170	–69	–38
Extracts and juices of fish and seafood	4	104	0	12	–94	–88
Prepared or preserved fish	23 747	64 820	22 582	63 070	–5	–3
Prepared or preserved seafood	1 657	5 541	1 544	4 636	–7	–16
Flours, meals and pellets of fish. Unfit for human consumption	1 563	1 631	1 476	1 577	–6	–3
Total	**34 450**	**101 419**	**32 362**	**98 191**	**–6**	**–3**

Table 30.8. **Imports by origin, 2008-09**

Countries of origin – 2008				Countries of origin – 2009			
	USD '000		Tonnes '000		USD '000		Tonnes '000
Chile	30 080	Chile	10 077	Chile	33 344	Chile	10 426
Ecuador	22 551	Thailand	6 869	Ecuador	25 354	Ecuador	7 510
Brazil	16 925	Ecuador	6 314	Brazil	15 232	Brazil	4 711
Thailand	15 680	Brazil	5 034	Thailand	10 648	Thailand	4 423
Spain	3 730	Peru	1 689	Singapore	4 856	Singapore	2 039
Malaysia	3 570	Malaysia	1 658	Malaysia	2 955	Malaysia	1 186
Peru	2 902	Spain	1 112	Spain	2 181	Spain	774
Subtotal	95 437	Subtotal	32 753	Subtotal	94 570	Subtotal	31 069
Total (% of imports)	**94**	**Total (% of imports)**	**92**	**Total (% of imports)**	**96**	**Total (% of imports)**	**96**

Table 30.9. **Exports in 2008-09 (tonnes)**

Description	2008		2009		Variation	
	Tonnes	USD '000	Tonnes	USD '000	Tonnes (%)	USD (%)
Live fish	1	61	1	56	0	–8
Fresh or chilled fish exc. fillets	7 666	14 270	7 405	15 042	–3	5
Frozen fish exc. fillets	142 224	223 306	167 072	225 221	17	1
Fillets and other fish meats	123 685	399 502	143 573	381 477	16	–5
Fish dried, salted or in brine, smoked/flour/ meals and pellets. Fit for human consumption	12 355	26 878	8 608	21 051	–30	–22
Crustaceans	43 358	383 603	54 121	328 486	25	–14
Mollusks	183 444	200 144	63 809	107 425	–65	–46
Products not expressed in other chapters. Unfit for human consumption	1 554	1 351	173	340	–89	–75
Fats and oils of fish or marine mammals	1 543	1 858	1 015	1 326	–34	–29
Extracts and juices of fish and seafood	76	303	34	127	–55	–58
Prepared or preserved fish	3 259	11 939	1 212	6 160	–63	–48
Prepared or preserved seafood	243	1 928	306	1 718	26	–11
Flours, meals and pellets of fish. Unfit for human consumption	42 193	34 139	37 487	30 313	–11	–11
Total	**561 601**	**1 299 282**	**484 816**	**1 118 742**	**–14**	**–14**

Table 30.10. **Export destinations, 2008-09**

Exports destinations – 2008				Export destinations – 2009			
	USD '000		Tonnes		USD '000		Tonnes
Spain	420 299	Spain	127 039	Spain	355 745	Spain	100 662
Italy	135 220	China	102 070	Brazil	142 820	Brazil	60 766
Brazil	113 038	Brazil	42 278	Italy	112 093	China	52 549
China	80 896	Italy	31 208	Japan	59 944	Italy	29 862
Japan	80 554	Japan	24 290	United States	56 616	Cameroon	22 175
France	65 066	United States	21 156	France	56 168	Japan	19 995
United States	62 909	France	16 438	China	50 665	United Status	19 400
Subtotal	957 983	Subtotal	364 480	Subtotal	834 051	Subtotal	305 408
Total (% of exports)	**74**	**Total (% of exports)**	**65**	**Total (% of exports)**	**75**	**Total (% of exports)**	**63**

Outlook

The Ministry of Agriculture, Livestock and Fisheries is working on a Strategic Federal and Joint Plan of Agrifood and Agroindustry. The main objectives for the fishing sector are as follows:

- To achieve a sustainable exploitation of fishing resources through an ecosystem approach to fisheries management and stock recovery, trying to achieve a biological and economical equilibrium and focusing on the commercial species that have not yet been fully exploited while avoiding fisheries and processing overcapacity.
- To promote measures related to biodiversity conservation and the ecosystems structure.
- To update regulations aimed at preserving the sustainability of the fishing resources exploitation.
- To strengthen the control and surveillance system to enforce management measures.
- To encourage the strengthening of technical and scientific research within a multidisciplinary programme to reduce uncertainty.
- To create an administrative and legal framework for small scale and artisanal fisheries.
- To optimise resource use through legal certification, the advantages derived from ecosystem environmental and natural conditions, the diversification of products, and food safety and quality.
- To update the technology of the fishing industry and to establish development programmes for value added products.
- To encourage the domestic consumption of fishing products to improve protein intake.
- To improve the status of fishing workers by fostering stable jobs.

PART IV

Chapter 31

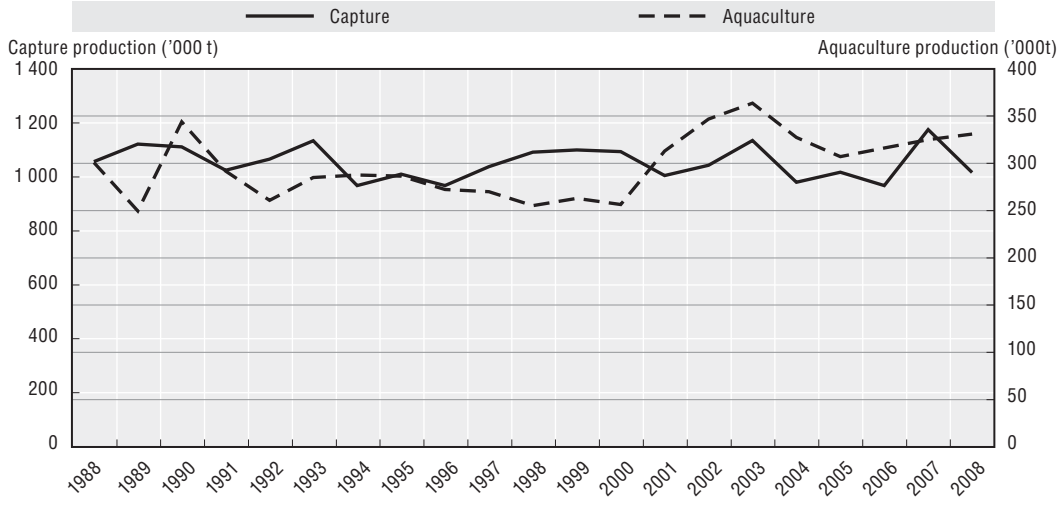
Chinese Taipei

Chinese Taipei

Summary of recent developments

- The fishery industry of Chinese Taipei is highly diversified with a large-scale deep sea commercial fishery as well as a community-based coastal and offshore fishery.
- The current vision of fisheries policy is to provide a favourable environment for the industry to develop in a sustainable manner that is of high quality, while ensuring food security and food safety.
- As a major producing economy, Chinese Taipei is aware of and willing to commit to new trends towards responsible fisheries to ensure sustainability.
- Major policy initiatives include the prohibition of fishing activities resulting in the depletion of fishery resources, the introduction of Total Allowable Catches (TAC) for selected stocks, the installation of Vessel Monitoring Systems on all deep sea vessels and the promotion of sustainable aquaculture and traceability of fisheries products.

Harvesting and aquaculture production (tonnes)

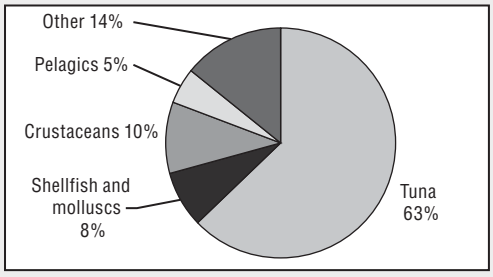


Source: FAO FishStat Database.

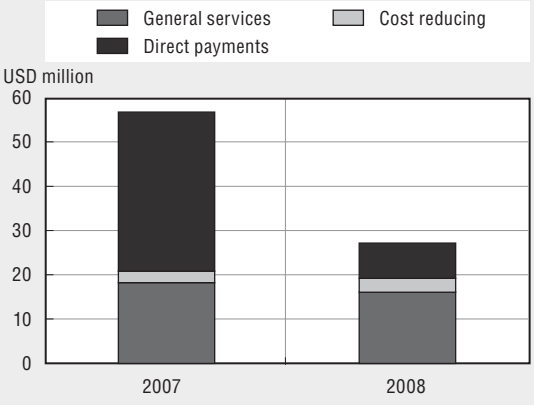
Key characteristics of the sector

- Fifty-eight per cent of the capture production, equal to more than 800 000 tonnes, originates from deep sea fisheries. Tuna fishing takes place mainly in the Central and Western Pacific Ocean while squid originates in the South-western Atlantic Ocean, the Northern Pacific Ocean and the Eastern Pacific Ocean.
- Marine capture fisheries accounts for more than 90% of all government financial transfers to fisheries and aquaculture. Aquaculture and marketing and processing account for the rest.
- Rewards linked to fishing vessels reduction programmes account for the lion's share in marine capture fisheries transfers.
- Chinese Taipei is a major player in international seafood trade. Export destinations are primarily in Asia, in particular Japan and Thailand, but also the United States.
- Total exports in 2008 amounted to 675 765 tonnes.
- Chinese Taipei implemented a three-year fleet reduction programme in 2005. 183 large-scale tuna long line vessels were scrapped or sunk by the end of 2007, more than the envisaged reduction of 20%.

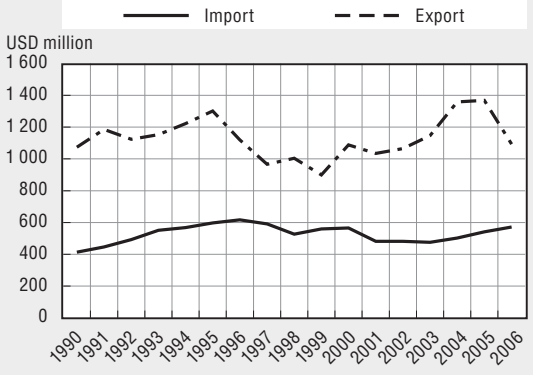
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2007	2008	% change
Number of fisher	237 705	257 891	8.5
Number of fish farmers	98 477	93 569	–5.0
Total number of vessels	25 622	24 889	–2.9
Total tonnage of the fleet	687 884	639 676	–7.0

Legal and institutional framework

The Fisheries Act constitutes the legal basis of Chinese Taipei's fishery management. Promulgated in 1929, this Act was amended seven times to effectively accommodate the changing fishery environment. A number of new regulations have recently been enacted or are currently in the process of legislation to incorporate international management trends, in particular with respect to combating illegal, unregulated and unreported fishing (IUU) fishing.

Regarding the institutional framework, the Council of Agriculture of the Executive Yuan is the central fisheries policy-making body under which the Fisheries Agency, the highest fisheries administrative agency, operates. The Director General, responsible for the day-to-day business of the Agency, is assisted by two deputy Director Generals and a Chief Secretary. The Agency consists of the Planning Division, the Fisheries Regulation Division, the Deep Sea Fisheries Division, the Aquaculture and Fisheries Facilities Division, the Secretariat, the Accounting Office, the Civil Service Ethics Office, the Personnel Office, the Deep Sea Fishery Research and Development Centre, the Northern Region Office and the Chinese Taipei Area Fishery Radio Station, responsible for implementing fisheries policies and providing various services to the industry.

In terms of international cooperation, Chinese Taipei participates in a number of international and regional fishery management organisations in various capacities, ranging from full membership to observer, including WCPFC, ISC, CCSBT, IATTC, ICCAT, SPRFMO and NPAFC. In addition, Chinese Taipei is also a member economy and takes actively part in the Fishery Working Group of the Asia Pacific Economic Co-operation (APEC).

Capture fisheries

Deep sea fisheries refer to those fisheries operated beyond the 200 nautical mile exclusive economic zone of Chinese Taipei. Major fishing methods include tuna long lining, tuna purse seining, trawling, squid jigging and torch light saury fishing. In recent years, the production has been over 800 000 metric tonnes, which accounts for over 58% of the overall fisheries production of the economy. Tuna long lining can be categorised into super freezer tuna long lining and conventional tuna long lining. Their fishing grounds cover major oceans of the world. The fishing grounds of the tuna purse seine fishery are concentrated in the Central and Western Pacific Ocean. Squid jigging mainly operates in the South-western Atlantic Ocean, the Northern Pacific Ocean and the Eastern Pacific Ocean, depending on the fishing seasons. The fishing grounds of trawlers have been restricted following the extension of the 200 nautical mile exclusive economic zones by coastal states in line with the provisions of the United Nations Convention on the Law of the Sea, and presently trawlers mainly operate in the waters of Indonesia under joint venture. Some of the squid jiggers operate in the Northern Pacific Ocean to carry out torch light saury fishery on a part time basis after the squid fishing season is over. Most tuna long liners and purse seiners use foreign ports as bases for replenishment of supplies, repairs and transhipment. Some 72 foreign ports have been approved as base ports for those fishing activities.

Coastal and offshore fisheries refer to those fisheries which operate within the internal waters, territorial waters and the exclusive economic zone of Chinese Taipei. Major fisheries include trawling, long lining, torch light fishing, mackerel purse seine fishing and set-net fishing. Their annual production is approximately 192 000 metric tonnes with a value of TWN 16.2 billion. In order to promote sustainable development of coastal and offshore fisheries resources, development is focused on the conservation of resources and the

restoration of ecology. With these in mind, measures such as vessel buybacks, fishing closures, establishment of closed areas, conservation areas and protected habitats have been implemented for the protection of fishery resources, and stock enhancement programmes such as release of fish seeds to improve the productivity of fishing grounds and stocking of resources have been carried out. Furthermore, assistance has been provided to fishers in engaging in recreational fishery activities, such as sea angling and dolphin watching, to diversify the development of coastal and offshore fisheries.

To cope with recent developments in fishery resources management, Chinese Taipei is in the process of implementing a series of policies to address issues such as responsible fisheries, overcapacity in fisheries, prevention of IUU fishing and integrated coastal management.

Firstly, a compulsory fleet size reduction programme has been carried out since 2005. In 2005 and 2006, 59 and 101 large-scale tuna long line vessels were scrapped or sunk respectively. In 2007, Chinese Taipei continued to reduce the large-scale tuna long line fleet by 23 vessels. After the completion of the three year fleet size reduction programme, the total number of large-scale tuna long liners larger than 100 GRT in Chinese Taipei has been reduced from 614 to 421, surpassing the objective of a 20% reduction of the world's total large-scale tuna long liners as proposed by the FAO International Plan of Action (IPOA) on Capacity.

Secondly, to be in line with international management agreements, the Regulations on Permission for the Export of Fishing Vessels were promulgated to control the building and exporting of foreign-flagged fishing vessels in Chinese Taipei. On 17 May 2007, the Regulations were further revised, requiring bilateral consultations between competent government authorities to ensure effective communication with the importing country before the industries build and export fishing vessels.

Yet another policy initiative to enforce responsible fishing is the requirement of equipment of vessel monitoring systems on all vessels fishing in the Chinese Taipei EEZ, under proper monitoring and control of the Fishery Agency, to prevention possible illegal activities.

Also, legislation for the implementation of integrated coastal management is in the process of public hearings. Coastal fishing will be under the enforcement of this new law once promulgated and concepts such as Marine Protection Area (MPA) will be introduced for the first time to fisheries management, to enforce its role in environmental protection. Through better integration of coastal and fishery management, it is expected that a sustainable fishery can be maintained.

Finally, to restore coastal fishery resources, it is planned that fishing of baby herring, flying fish, larval fish, Japanese anchovy and Buccaneer anchovy will be banned in three years.

Aquaculture

Aquaculture in Chinese Taipei can be classified into fresh water farming, brackish water farming, and mariculture. Having a farming acreage of about 54 000 hectares, aquaculture has an annual production between 282 to 331 000 metric tonnes, with a value of about NTW 30 billion. Aquaculture development will continue to focus on the rational use of land and water resources and the upgrading of product quality. Through the core development of dedicated aquaculture areas and improved aquaculture, the acreage of fish ponds will be reduced and infrastructure for water supply will be constructed. Marine cage farming will be developed for the building of sea parks, also in view of recreational uses of fish farming.

The current policy focuses on promoting environment-friendly aquaculture. The government will continue to assist fish farmers to meet certification criteria when introducing organic aquaculture and recycling of pond water.

Fishery and the environment

With the intention to adopt practices which promote a sustainable fisheries industry and treasure the marine resources, the following activities are taking place or will be implemented:

Harbour dredging

Regular dredging operations are to be carried out on harbour passages and in bay areas. This will revitalise the function and environment of harbours, ease the difficulties fishers may encounter when going to sea and create a sustainable industry that fulfils both functional and recreational purposes.

Promote sustainability for the distant water fishery

Chinese Taipei will continue promoting sustainability projects for distant water fisheries and implement management systems that conform to the international trend of responsible fisheries. Multilateral collaborations are encouraged between government associations from different countries to ensure the sustainability of marine resources in high seas. There is a strive to protect the status of Chinese Taipei within the international fisheries community and to protect the rights of fishers, whilst managing the economic benefits of the industry and complying with the principles of marine ecology conservation.

Management of coastal and offshore vessel dynamics

In order to meet the requirements of both international and domestic fisheries management systems, as well as to protect the needs of coastal and offshore marine resources, a Vessel Monitoring System (VMS) is used to monitor the locations and movements of vessels at sea. This greatly improves the efficiency of dynamic resource management.

Implement the vessels reduction programme

To achieve a rational utilisation of fishery resources, in line with the global trend of decreasing fishing quotas and to contribute to decreasing the impact on coastal and offshore fisheries as a result of joining the WTO, a strategy of adjusting the fisheries industry operational structure and scale is implemented. The vessel buyback programme is implemented as part of this strategy to help achieve sustainability for coastal and offshore fisheries.

Reward those involved in the fishing moratorium

The strategy of rewarding participants in the off-fishing season will help reduce fishing efforts and thus reduce some of the pressure on marine resources. By committing to the conservation and protection of marine resources, their sustainability can be guaranteed.

Implement specific coastal and offshore fishing business management systems

Monitoring and control systems should be reinforced on certain categories of the fishery, such as coral, flying fish caviar and anchovy fisheries. Such systems include the use of observers boarding vessels at sea to carry out inspections, observers going to sea with vessels to observe and monitor catches, and investigation officers at ports to measure the amount of catch and check the log books. Furthermore, conservation and management of artificial reefs should be expanded in order to help achieve the objective of conserving marine resources for sustainability.

In order to promote the health and quality of the fishery industry, and protect consumer rights, the following measures have been taken or planned:

Encourage excellent aquaculture production systems

Chinese Taipei helps aquaculture processing plants to apply for the logo of Premium Agricultural Product Certification, (Certified Agricultural Standard – CAS) and to introduce Hazard Analysis Critical Control Point (HACCP) systems. In addition, the implementation of product certification and inspection institutions in order to build a product traceability system is promoted.

Construct an excellent aquaculture product management system

To improve the quality of Chinese Taipei's aquaculture products, ensuring they meet international health and hygiene standards, aquaculture farms should be encouraged to implement better self-governance and management systems such as product traceability system. This will result in the production of excellent quality aquaculture products which comply with good hygiene standards and hence increase competitiveness.

Control the quality of aquaculture products

By introducing source controls, self-governance and management, and the principle of responsibility for the product hygiene, standards and quality of aquaculture products can be improved and food safety guaranteed for consumers.

Government financial transfers

Table 31.1 describes the situation of government financial transfers. It shows that the largest amount is devoted to deep sea fishery in the annual budget of the Fisheries Agency. The annual budget of the Fisheries Agency peaked in 2004. With a few exceptions, such as the Fishery Radio Station and the Deep Sea Fishery Development Centre, the largest government financial transfer category was direct payments which outweighed the sum of cost reducing transfers, general services and cost recovery charges by a very large margin.

This result depicts the policy of the government: government financial transfers are to be decoupled from production volume or input factors. Such a policy orientation is in line with the current global practice.

The overall distribution can be better analysed in percentages. When divided into sub-sectors, it is clear that the majority of government financial transfers are devoted to marine capture fisheries, accounting for between 92% and 96%. Aquaculture, as well as marketing and processing, have been relatively small in amount and never exceed 5% (Table 31.2).

Table 31.1. **Government transfer payments, including the Fisheries Agency budget**

Fishery administration annual administration budget[1]	2007	2008	2009
Marine capture fisheries	1 708 679 578	856 175 667	766 046 981
Direct payments	1 081 436 127	249 904 662	186 290 416
Fishing vessels reduction programme	451 277 927	. .	. .
Fishing vessels buy-back programme	512 608 000	. .	. .
Reward for closing fishery season	117 550 200	249 904 662	186 290 416
Cost reducing transfers	78 142 451	100 712 686	87 413 263
Fishing vessels marine insurance reward	78 142 451	100 712 686	87 413 263
General services (budget)	549 101 000	505 558 319	492 343 302
Scientific research	79 326 000	62 182 089	66 717 212
International co-operation	2 257 000	1 971 739	1 835 138
General administration	356 391 000	333 971 562	320 159 862
Deep Sea Fishery Development Center	44 585 000	48 582 776	44 289 752
Fishery broadcasting station	66 542 000	58 850 153	59 341 338
Cost recovery charges	. .	. .	. .
Aquaculture	38 060 000	30 340 000	46 620 868
Direct payments	2 000 000	2 900 000	1 000 000
Extension of re-use of pond water used in aquaculture	2 000 000	2 900 000	1 000 000
Cost reducing transfers	. .	. .	. .
General services (budget)	36 060 000	27 440 000	45 620 868
Scientific research	36 060 000	27 440 000	45 620 868
Cost recovery charges	. .	. .	. .
Marketing and processing	36 486 000	28 319 071	17 422 582
Direct payments	. .	. .	. .
Cost reducing transfers	. .	. .	. .
General services (Budget)	36 486 000	28 319 071	17 422 582
Scientific research	11 535 000	9 803 154	7 485 232
Management and information technology	24 951 000	18 515 917	9 937 350
Cost recovery charges	0	0	0
Fish Products Market Stabilisation Fund	0	0	0
Grand total	**1 783 225 578**	**914 834 738**	**830 090 431**

Source: Fisheries Agency, *Annual Budget Report*, 2007-09.

Table 31.2. **Government transfer payments by sub-sector, including Fisheries Agency budget (per cent)**

	2007	2008	2009
Marine capture fisheries	95.82	93.59	92.28
Aquaculture	2.13	3.32	5.62
Marketing and Processing	2.05	3.10	2.10

Source: Fisheries Agency, *Annual Budget Report*, 2007-09.

Table 31.3 describes the breakdown of government financial transfers in marine capture fisheries. It can be seen that the largest item is Reward for Fishing Vessels Reduction Programme, accounting roughly between 1/4 and 2/3 of the entire government financial transfers, depending on whether or not annual administration budget is included. This is the amount the government pays to fishers for retiring from fishing during certain periods of the year. The purposes of such payments are to restore fish

stocks, reduce total fishing efforts and other long term objectives. Other major items exceeding 5% include Fishing Vessels Buy-back Programme and Reward for Closing Fishery Season if the annual administration budget is taken into account. When excluding the annual administration budget, the distribution varies proportionally.

Through cross tabulation, it is clear that the single largest item of government financial transfers is Fishing Vessels Reduction Programme in marine capture fisheries, a resources-sustaining programme.

Table 31.3. **Marine capture fishery government transfer payment breakdown (% of total GFT)**

	2007	2008	2009
Direct payments	63.29	29.19	24.32
Fishing Vessels Reduction Programme	26.41	0.00	0.00
Fishing Vessels Buy-back Programme	30.00	0.00	0.00
Reward for closing fishery season	6.88	29.19	24.32
Cost reducing transfers	4.57	11.76	11.41
Fishing vessels marine insurance reward	4.57	11.76	11.41
General services (Budget)	32.14	59.05	64.27
Scientific research	4.64	7.26	8.71
International co-operation	0.13	0.23	0.24
General administration	20.86	39.01	41.79
Deep Sea Fishery Development Center	2.61	5.67	5.78
Fishery broadcasting station	3.89	6.87	7.75

Source: Fisheries Agency, *Annual Budget Report*, 2007-09.

Post harvesting policies and practices

Excellent quality and ample supply of raw materials are the basic requirements of Chinese Taipei's fish processing industry. Based on the demand in foreign markets, varieties of processed sea products have been developed. Among the processed seafood, the processing technique and quality of frozen roasted eel for export are most prominent. Processing of traditional frozen food products such as fish ravioli, shrimp ravioli, fish steaks, squid balls, etc. has been successfully developed. With years of experience, production of cured and canned food has entered into an era of full automation and superb quality. In addition, there is an important demand for seafood snacks, such as shredded dried squid, tuna candy and kelp candy. The development of items such as eel calcium, eel oil essence, clam essence and collagen from fish skins have pushed the seafood industry to a level of using fish offal in producing by-products, thus enabling the industry entering into an era of high refinement and outstanding quality. With respect to fish distribution, the function of fish markets and direct sales centres will be strengthened. The system of computer auctioning of fish and fish products will be promoted to establish a fair, transparent, efficient and service orientated marketing and distribution system.

Markets and trade

Chinese Taipei is one of the major fish and fish product exporters in the global trade system with deep sea fishery and aquaculture being the major sources. Major export markets, as indicated in Table 31.4, are Japan, Thailand and the United States. These three markets account for over 60% of Chinese Taipei's total fishery products export in value.

Table 31.4. **Major export markets, 2008**

	Quantity (Mt)	Quantity (%)	Value (TWN '000)	Value (%)
Total	**675 765**	**100.00**	**48 133 191**	**100.00**
Japan	90 608	13.41	17 296 658	35.93
Thailand	194 576	28.79	8 511 619	17.68
United States	55 205	8.17	4 915 830	10.21
Philippines	36 449	5.39	1 924 410	4.00
Korea	33 980	5.03	1 710 517	3.55

Source: Fisheries Statistical Yearbook Chinese Taipei, Kinmen and Matsu Area, 2008.

To adapt to trade liberalisation after Chinese Taipei's accession to the World Trade Organization, and to improve the competitiveness of Chinese Taipei's fishing industry, enhancement of overseas market promotion of Chinese Taipei's fishery products will no doubt be one of the central means to achieve sustainable development of Chinese Taipei's fishing industry. Premium quality Chinese Taipei fishery products with export potential have been selected, and focusing on such markets as the United States, Japan, Korea and the European Union, assistance has been provided to fishers and fisheries associations to participate in international food and sea products expositions and exhibitions, for their overseas marketing promotion campaign. Extensive fisheries trade information will be collected to be informed about all information on export opportunities. Those organisations with marketing capability will be institutionally strengthened or integrated and an international label for sea products will be developed.

With respect to the domestic market situation, there were 50 regional fish wholesale markets in 2008, including 14 fish markets in consumption areas and 36 fish markets in production areas. The grade and distribution of these markets are presented in Table 31.5. In 2008, wholesale fish market transactions amounted to 552 273 tonnes with a total value of NTW 31 billion, showing an increase in volume of 39 209 tonnes and an increase in value of NTW 578 million compared with those of 2007.

Table 31.5. **Chinese Taipei regional wholesale fish markets by grade (2007)**

Market grades by trading volume	Volume of market (t)	Production area fish markets	Consumption area fish markets	**Total**
Superior	65 000 and over	2	–	**2**
1	64 999-20 000	2	2	**4**
2	19 999-10 000	3	3	**6**
3	9 999-4 000	5	4	**9**
4	3 999-2 000	5	3	**8**
5	Below 2 000	19	2	**21**
Total		**36**	**14**	**50**

Source: Fisheries Statistical Yearbook Chinese Taipei, Kinmen and Matsu Area, 2008.

Outlook

Recognising the importance of the fishery industry in sustaining the environment and the economy, a series of policies are in place to gradually guide the development towards such goals. In addition to the economic perspective, sustainability in fisheries can be further secured through three different aspects: ecology, food safety and work safety.

First, on the ecological perspectives, the overall theme of the new set of policies is sustainability. Appropriate programmes will be developed for deep sea, offshore and coastal fisheries as well as for aquaculture.

For deep sea fisheries, the focus is on the management of adequate fishing capacity and responsible fisheries. As mentioned above, policy actions include strengthening monitoring and control of long line vessels through satellite-base vessel monitoring system (VMS), the reduction of fleet size and inspection programmes of international management measures at foreign ports.

With regard to offshore and coastal fisheries, the main focus is to restore the marine ecosystem. Actions taken include the implementation of TACs on selected stocks and the prohibition of harvesting of certain species. The promulgation of the Coast Management Act in the future will further contribute to safeguarding the marine ecosystem.

With respect to aquaculture, it is envisaged to develop new technologies that will enable sustainable fish farming while protecting the environment. Programmes like pond water recycling and organic aquaculture certification are already in full operation, and further policy tools are to be introduced.

In order to properly provide a sufficient source of safe and good quality protein to satisfy the daily diet of the general public, food safety of fishery products is a prioritised policy item, which is implemented through the two phases of production and processing. During the production phase, the concept of organic aquaculture is promoted and education on prudent application of medication is continuing. For the processing phase, traceability of fishery products is the programme that is currently advocated. Through the introduction of HACCP (Hazard Analysis Critical Control Point) quality control standards it is expected that the food safety aspect of fishery products can be safeguarded.

Finally, the government will continue to implement various projects in collaboration with international fishery organisations to ensure the sustainable development of Chinese Taipei fisheries. The government will also maintain a fleet of advanced distant water fishery vessels that comply with international regulations, promote the conservation of the coastal and offshore ecosystem, and encourage the sustainable utilisation of marine resources and will strive to adjust the aquaculture industry structure to become environmentally friendly. All these efforts are made in the interest of creating more profits and improving the welfare of fishers and the general public; the government strives to realise the vision of a healthy fishery with superior hygiene and safety, a technologically advanced fishery, and a fishery that brings enjoyment and recreational opportunities.

PART IV

Chapter 32

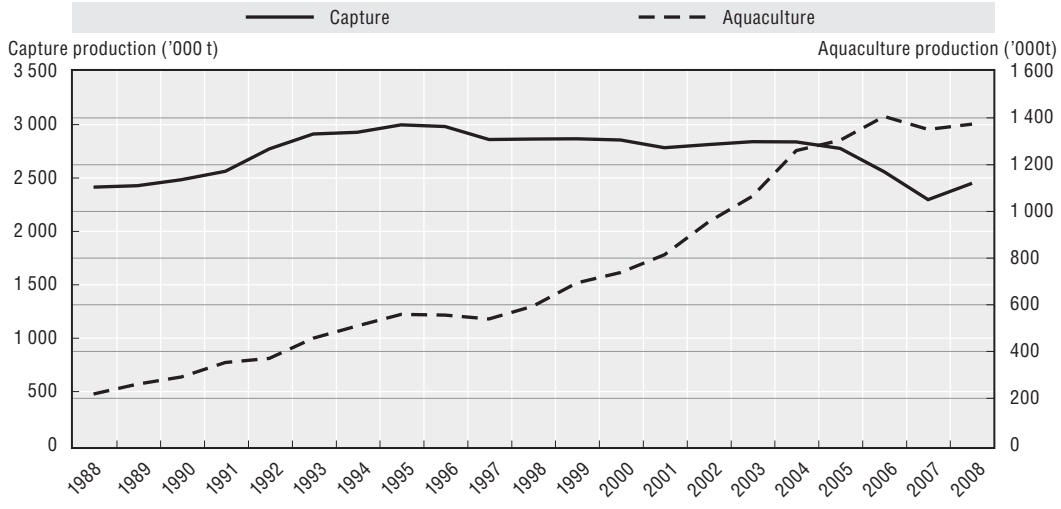
Thailand

Thailand

Summary of recent developments

- Thailand's aquaculture production has been increased significantly since 1988 while capture fishery production has shown a slight downward trend since 1997.
- Under the Fisheries Act of 1947, Thailand adopted notifications in 2008 to prohibit Trawler and Push net fishing vessel equipped with engine operation in three coastal provinces: Narathiwat, Pattani, Rayong. In 2009, there were notifications adopted for prohibition of Trawler and Push net fishing vessel equipped with engine operation in some areas in two coastal provinces: Satun and Nakon Srithammarat.
- In 2010, the Department of Fisheries (DOF) has approved a new national Good Aquaculture Practice (GAP) which is stricter than the original GAP in order to increase high quality of aquaculture products. The new GAP standard covers five aspects: food safety and quality, animal welfare, environmental friendly, social responsibility and traceability.
- The rehabilitation of marine ecosystem strategies developed under the Marine Fisheries Management Master Plan have specified the delimitation of marine fishing grounds and the closed season to fishing. With the provision of active participation by the community and fisher's organisations, the strategies focus on regular monitoring of the rehabilitation activities that have been carried out for the ecosystem, fisheries resources, and local fishing grounds. Resource rehabilitation is to be carried out at the local level.

Harvesting and aquaculture production (tonnes)

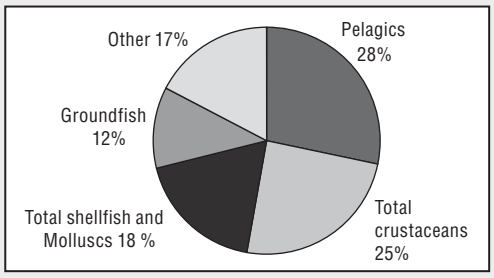


Source: FAO FishStat Database.

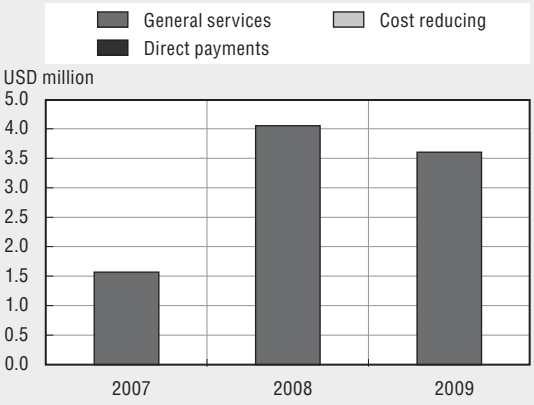
Key characteristics of the sector

- The most important species landed in 2008, in terms of value, were pelagic (28%), followed by crustaceans (25%), shellfish and molluscs (18%), and groundfish (12%).
- A total of USD 4.5 million was given as government financial transfers to the fisheries sector in 2009, which is a slight decline from that of 2008 (USD 4.6 million). These all took the form of direct payments.
- Thailand has had a positive trade balance in fisheries products, both in volume and in value. The growth of fishing exports and imports since 2005 has been remarkable. In 2008, the value of fisheries product exports was USD 6 469 million, a 45.9% increase in value compared to 2005 (USD 4 435 million). The most important components were shrimp, canned tuna, squid and cuttlefish. In 2008, the total value of imports was USD 2 417 million, which is a 69.7% increase compared to 2005 (USD 1 424 million).
- Thailand's fleet capacity has decreased in recent years, in terms of numbers of vessels and in terms of tonnage.

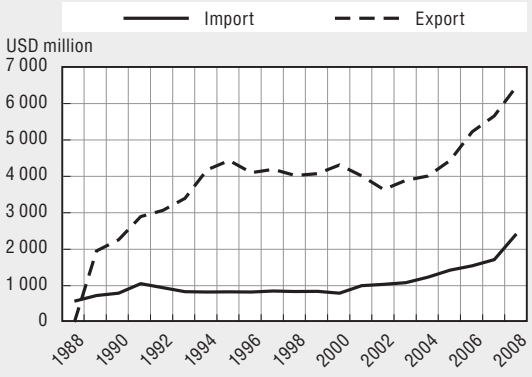
Key species landed by value in 2008



Evolution of government financial transfers (USD million)



Trade evolution (USD millions)



Capacity

	2006	2008	% change
Number of fishers	80 538	n.a.	n.a.
Number of fish farmers	62 598	n.a.	n.a.
Total number of vessels	13 627	12 920	–5.2
Total tonnage of the fleet	441 171	359 038	–18.6

Legal and institutional framework

Key legislations regulating Thai fisheries include: the Fisheries Act (1947), revised in 1953 and 1985; the Act Governing the Right to Fish in Thai waters (1939); the Act Organising the Activities of the Fish Market (1953); the Wildlife Reservation and Protection Act (1992); and the Enhancement and Conservation of National Environmental Quality Act (1992).

The Fisheries Act (1947) has a provision for adoption of regulations or notifications, and there are a number of regulations and notifications that have been adopted for management of freshwater and marine fisheries. In 2008, notifications were adopted for the prohibition of trawler and push net fishing vessels equipped with engines in three coastal provinces: Narathiwat, Pattani, Rayong. In 2009, there were notifications adopted for the prohibition of trawler and push net fishing vessels equipped with engines in two other coastal provinces: Satun and Nakon Srithammarat.

Capture fisheries

Performance

In 2008, the quantity of marine fish landed at major landing places in the Gulf of Thailand and the Andaman Sea was 1 644 832 metric tonnes with a THB 42 147.011 million value, while it was 1 496 162 tonnes with a THB 42 718.580 million value in 2009. It is estimated that 60.38% of the total marine catch was caught in the Gulf of Thailand while 39.62% from the Andaman Sea.

The main species harvested were Indo-Pacific mackerel, Indian mackerel, king mackerel, anchovies, round scads, trevallies, jellyfish, blue swimming crab, short necked clam, squid, cuttlefish, octopus, and banana shrimp.

The number of fishing vessel registered in 2008 totalled 12 920, composed of 6 222 of less than 14 metres, 3 048 of 14-18 metres, 3 546 of 18-25 metres and 104 vessels of more than 25 metres.

Status of fish stocks

In the Gulf of Thailand, the rapid development of marine fisheries began in 1973 and led to a sharp increase in terms of landings: from 141 608 metric tonnes in 1973, it more than quadrupled (614 814 metric tonnes) by 1994. The tonnage continued to increase and in 2008, the landings were reported to be 642 472 metric tonnes. These landing statistics clearly show that the pelagic resources have been fully exploited. It is noted that for the pelagic fish, *e.g.* Indian mackerel, the condition of the stocks are at the verge of over-exploitation. The fishery resource assessment also concluded that the maximum sustainable yield (MSY) of the Indo-Pacific mackerel was around 104 000 metric tonnes and that this level of exploitation had been reached in 1984.

In term of fish landings from the Andaman Sea, the decade beginning as of 1994 showed a fluctuated between 800 000 metric tonnes in 2000 and 970 000 metric tonnes in 1998. Apart from the trash fish, the composition of the annual catch ranked by volume was pelagic fish (20-36%), invertebrates (14-35%) and demersal fish (11-21%).

Management of commercial fisheries

The following management instruments are in place:

- *Closed areas and closed seasons for fishing based on the results of fish stock assessment research*: Various regulations on areas and seasonal closures have been implemented since 1984. From 1 February to 31 March and from 1 April to 15 May, trawlers and purse seiners using mesh size smaller than 4.7 cm are prohibited from fishing in the upper southern areas of the Gulf of Thailand.
- *Conservation zone*: All inshore areas extending to 3 km from shore have been proclaimed a conservation zone. Trawling and motorised push netting of any types are prohibited.
- *Fishing gear restrictions:* Light luring fishing has been known to attract not only target species such as anchovy, squid and cuttlefish, but also juveniles of valuable species. The banning of its use in fishing, especially the surrounding nets with mesh size less than 2.5 cm, has been imposed. Furthermore, anchovy fishing by cast and lift nets equipped with light luring must use 0.6 cm mesh size or more.
- *Fishing gear licensing:* Large stationary fishing gears are required by law to be registered with the corresponding installation and operation. Most fishers know how to comply with this legal requirement since the visibility and immobility of their fishing gear serve as an easy control and is convenient for inspection. For more sophisticated and expensive fishing gear, the management system has been designed to limit their entry by, for example, limiting their registration. Under the licensing system, only fishers who have a fishing license are allowed to apply for annual extension of their license. This type of license is non-transferable, although it can be inherited.
- *Clamping down on destructive fishing gears:* With the problem of excess fishing capacity, the DOF tried to introduce a tenure system to manage the commercial fishing gear licensing. From 1 November of this year, all types of trawlers are required to obtain an operation license on a yearly basis. With the fishing year established from 1 April to 31 March 2011, fishers who fail to revalidate their licenses will be automatically removed from the registration system.

Monitoring and enforcement

Fishing vessels must be registered by the Marine Department. The Department of Fisheries will provide the necessary licenses for the use of any fishing gears.

The Department of Fisheries has set up various management measures through the Fishery Act of 1947. Many Ministerial Regulations for management and conservation have been periodically issued and implemented such as closed areas and closed season, conservation zone, fishing gear restrictions (as mentioned above).

Aquaculture

Policy changes

For a decade, the Department of Fisheries has encouraged fish farmers to implement Good Aquaculture Practice (GAP) and a Code of Conduct (CoC) for responsible farming practices to ensure that fish and shrimp produced from farms are free from antibiotics and other prohibited drug residues, as well as farms operated in a responsible manner with regards to social and environment aspects. In 2010, the DOF approved a new National GAP practice in order to increase high quality of aquaculture products. The new GAP is stricter

than the original GAP and covers five aspects: food safety and quality, animal welfare, environmental friendly, social responsibility and traceability. However, the DOF has provided a transition period for farmers; the new GAP will be fully implemented throughout the country by 2013.

Production facilities, values and volumes

Table 32.1. **Production facilities, values and volumes**

Type	2007		2008		2009[1]	
	Farm	Rai	Farm	Rai	Farm	Rai
Total	**544 246**	**1 445 787.88**	**544 184**	**1 404 878.53**	**550 669**	**1 381 937.37**
Coastal aquaculture	48 122	513 109.88	43 399	443 508.27	45 290	449 045.37
Shrimp	30 311	427 511.00	25 041	342 235.00	26 000	345 000.00
Fish	11 363	5 697.79	11 988	5 034.27	12 546	5 462.07
Shell	6 448	79 901.09	6 370	96 239.00	6 744	98 583.30
Freshwater aquaculture	496 124	932 678.00	500 785	961 370.26	505 379	932 892.00

1. Estimation.

Government financial transfers

Government Financial Transfers (GFTs) in Thailand were USD 27 million in 2009; 83.3% to aquaculture sector and 16.7% to marine capture sector. GFTs to aquaculture included disaster relief payments USD 12.1 million, management services USD 9.4 million and research services USD 1 million. GFTs to marine capture fisheries included enforcement services USD 3.3 million, management services USD 0.7 million and research services USD 0.5 million.

Transfer policies

The total amount of government financial transfers to aquaculture for 2007-09 increased by 5.4% per year; direct payments for disaster relief increase one time and general services increased by 0.9% per year. On the other hand, transfers to marine capture increased by 4.5% per year, which were for general services only.

Post harvesting policies and practices

Post harvesting policies

Aiming to improve efficiency and transparency of quality control system, the outsourcing of inspection services and laboratory analyses to the private sector will be fully implemented by 2013. The DOF will accredit the private company that would like to provide inspection and laboratory analyses services. However, the health certification of export fishery products must be undertaken by the competent DOF authority of fishery products.

Markets and trade

Markets

Promotional efforts

For import control regulation, since the outbreak of Infectious Myonecrosis Virus (IMNV) in Indonesia, the DOF does not allow imported shrimp from Indonesia. For shrimp from other countries, an import permit will be issued if a certification for shrimp free from IMNV is attached.

Trade

Export and import

Thailand has had a positive trade balance in fisheries products, both in volume and in value. The growth of fishing exports and imports during 2005-09 has been remarkable. In 2009, the volume and value of fisheries product export was 1 883 680 tonnes and THB 224 542 million, 1.2% less in volume and 1.6% less in value than in 2008. The most important products were shrimp, canned tuna, squid and cuttlefish. Shrimps were mainly exported to Japan and the United States, canned tuna to the European Union and the United States, squid and cuttlefish to Japan and Italy, and fresh or frozen fish mainly to Malaysia and Singapore.

Thailand is the top importer of fresh/chilled/frozen tuna in the world. In 2009, the total volume and value of imports was 1 586 592 tonnes and THB 68 508 million, respectively. It was 3.3% greater in volume, but 15.6% less in value, compared to 2008.

Outlook

Fisheries resources rehabilitation in the Thai waters

The rehabilitation of marine ecosystem strategies developed under the Marine Fisheries Management Master Plan have specified the delimitation of marine fishing grounds and the closed season to fishing. With the provision of active participation by the community and fishers' organisations, the strategies focus on regular monitoring of the rehabilitation activities that have been carried out on the ecosystem, fisheries resources, and the local fishing grounds. Resource rehabilitation is to be carried out at the local level. Sea ranching has been coined as an integrated approach for the promotion of marine fisheries for improving the economy and income.

Development of marine fisheries management administration

The development of marine fisheries management administration under the Master Plan has prescribed the improvement of various legal instruments and measures. The Fisheries Law and its various regulations and rules must be made compatible with the innovation and development of fishing gears and fishing technologies. Fishing ground delimitation will be carried out at the provincial level in all coastal provinces. Promotion will focus on fishing rights management as a means to motivate resource users to participate actively in resource conservation and management. Fisheries co-management that actively involves the communities to work side-by-side with the government will be promoted. Fishing effort will be managed in accordance with the state of the fishery resources in order to ensure maximum fishing efficiency. It cannot be emphasised enough that co-management is the key.

Marine fisheries development in line with various international agreements and resolutions

The Marine Fisheries Development Master Plan has a provision to undertake the development in line with various international agreements and resolutions:

- Control of illegal fishing by controlling/prohibiting the trade of fish from illegal and destructive fisheries; Enhance the capacity of Monitoring, Control, and Surveillance – MCS; Port State measures; Vessel Monitoring System – VMS; Vessel Positioning System – VPS with active participation of the local governments and fishermen's organisations.

- Administer the long-distance fishing to facilitate its smooth operations and to distinguish it from the fishing within the national waters. Overseeing the preparation of a long-distance fishing agreements, terms and conditions as well as commitments prior to submission for approval by the host country. Promotion of joint ventures in fisheries management with the neighboring countries in a multi/bi-lateral arrangement that requires commitments by the state to administer the compliance with the agreed terms and conditions, *e.g.* number and size of fishing vessels, fishing gear, safety measures, and assurance on sustainability. The state is also required to educate fishing enterprises and crews in international laws, regulations, rules, and agreed provisions of the joint venture, fishing in the high seas, and other measures of the international standards for safety at sea.

Development of fish utilisation

The utilisation of fish as prescribed by the Marine Fisheries Development Master Plan comes with the provision for the promotion of maximum use of the fish catch. This provision has prescribed the direction of the development process and the promotion of activities leading to reduce the post-harvest loss both at sea and at the landing port. The Master Plan also has a provision for the promotion of using the fish for human consumption and for value-added processing. The improvement of fisheries infrastructure and transportation are necessary means to ensure a higher quality standard of the catch and the post-harvest processes that help reap the highest possible value added of the catch.

Development of distance fisheries

The Marine Fisheries Development Master Plan prescribes a strategy in applying Thailand's strengths and greater opportunity in fisheries to the participation in distance fisheries as universally practiced. This strategy is necessary for cutting down the fishing efforts presently deployed in the national waters. The future distance fishing fleets must be better equipped with various databases that provide pertinent information, *e.g.* number, type, and size of all fishing vessels, fishing crews, as well as the policies governing the resource utility and various conditions pertinent to the structural improvement of the state's and the private sector's capacities. The establishment of a distance fisheries development fund is an option.

Aquaculture

The process of developing a master plan for aquaculture would include area zoning.

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